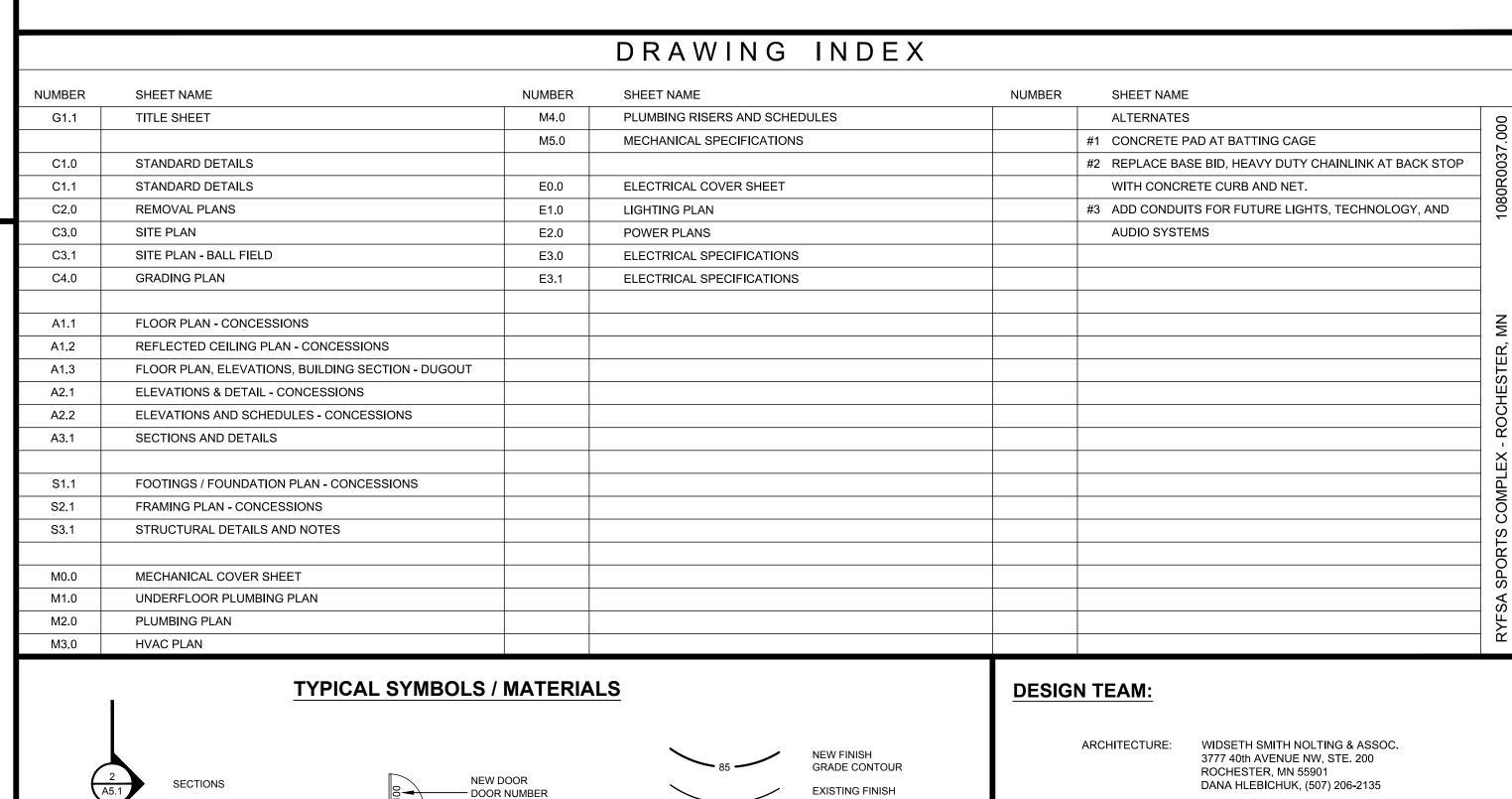
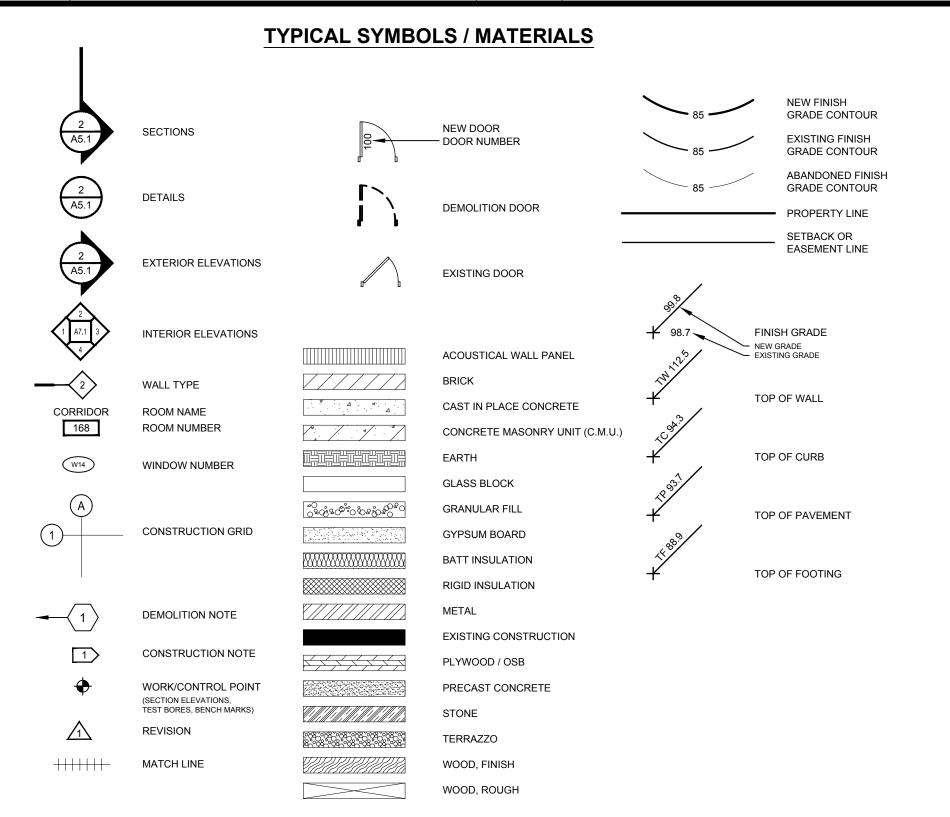
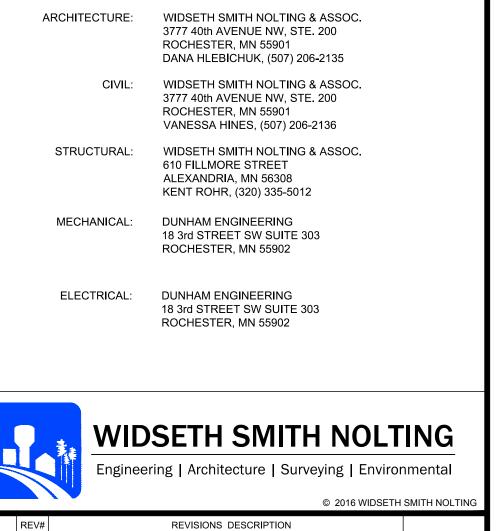


# RYFSA SPORTS COMPLEX ROCHESTER COMMUNITY AND TECHNICAL COLLEGE

# ROCHESTER, MINNESOTA







JUNE 15, 201

SHEET NO.

SHEET OF

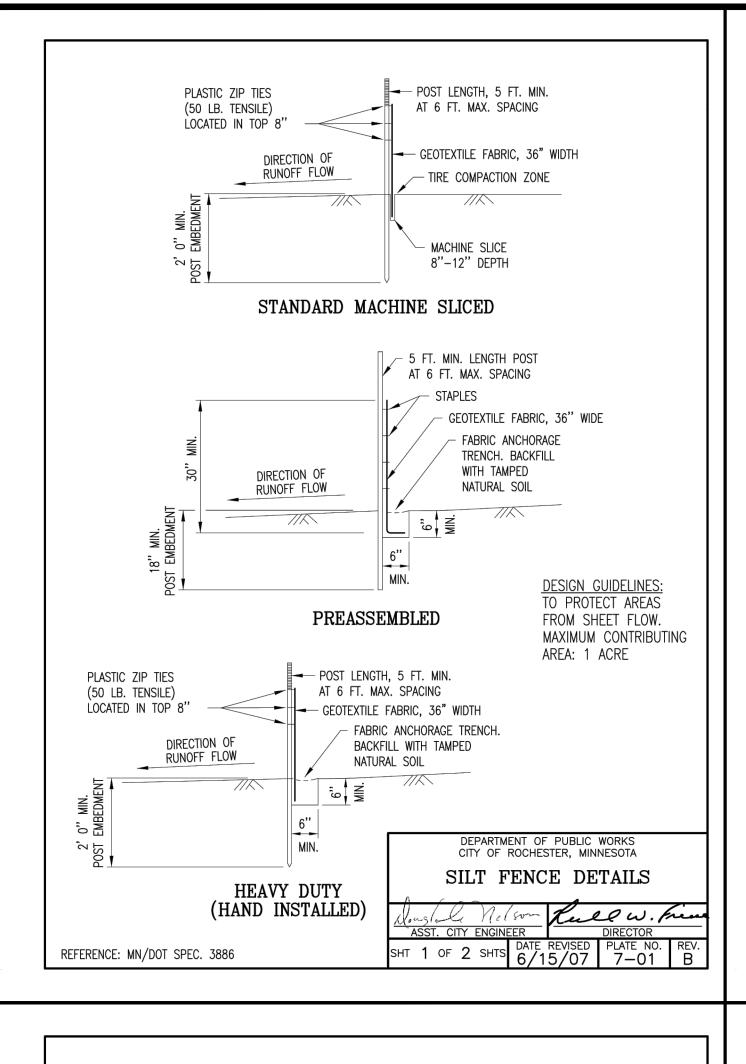
REPORT WAS PREPARED BY ME OR UNDER MY DIRECT

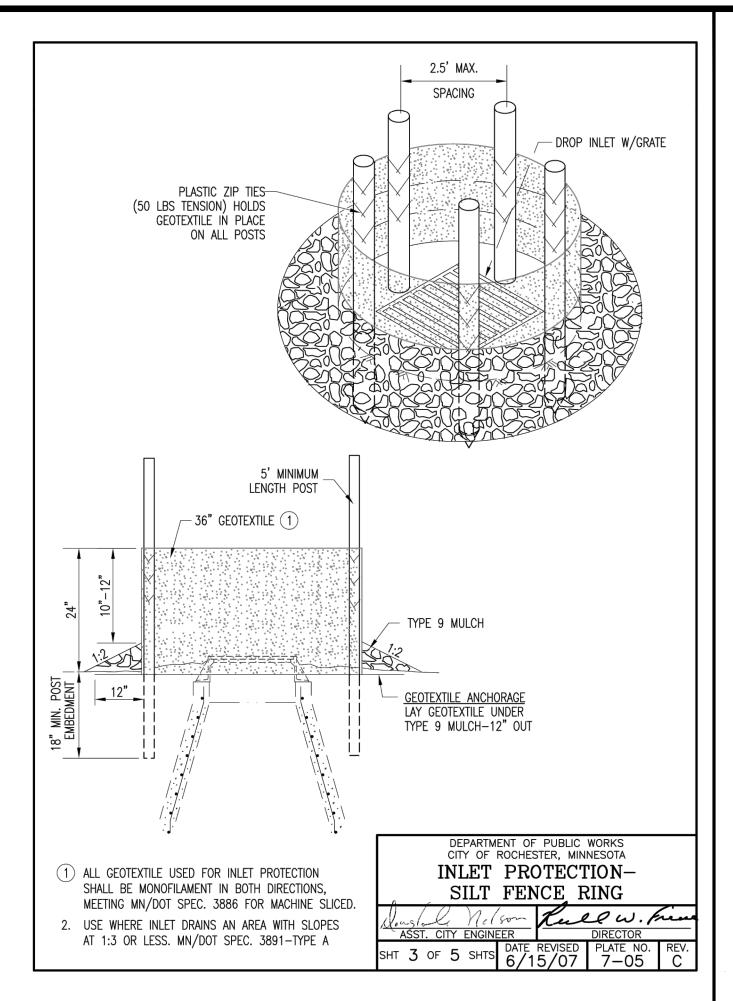
DANA J. HLEBICHUK

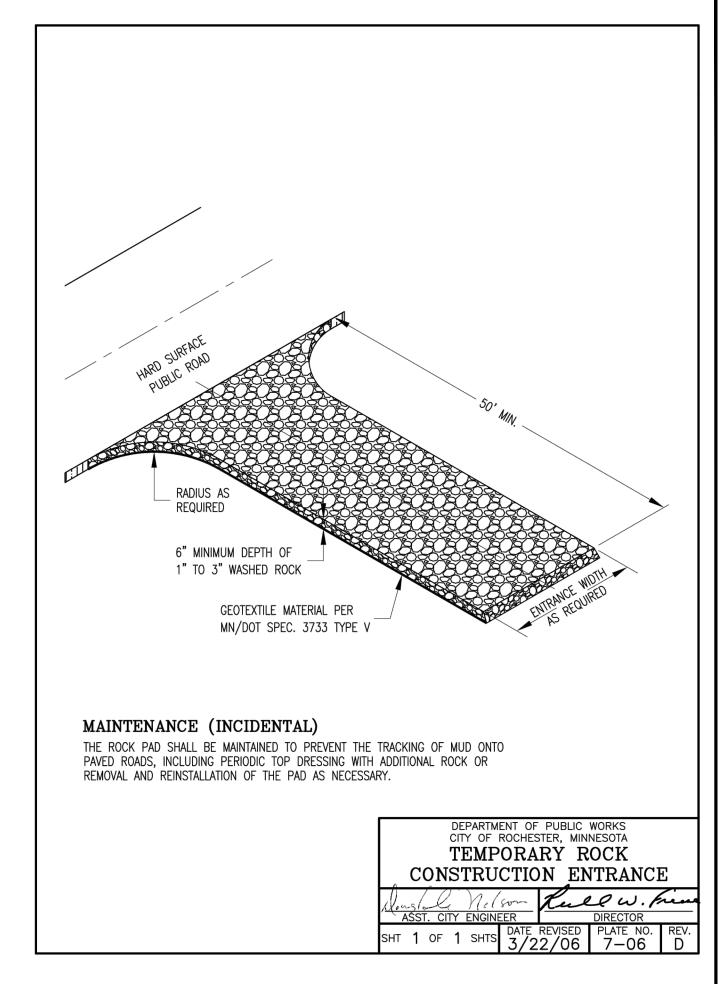
ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

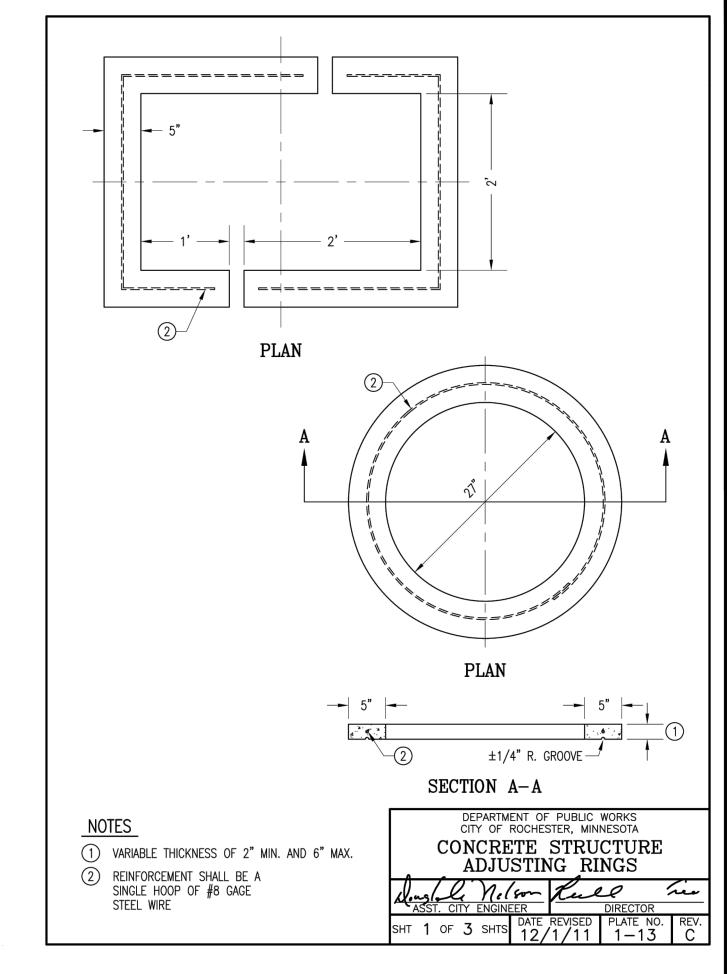
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DATE: 06/15/2016 LIC. NO.44719



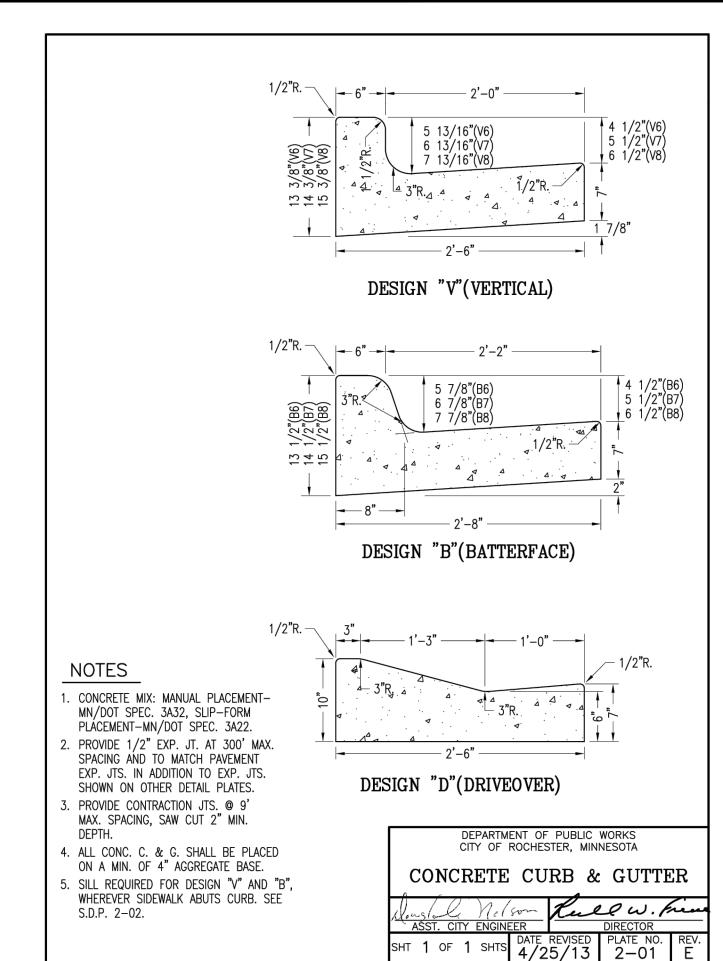


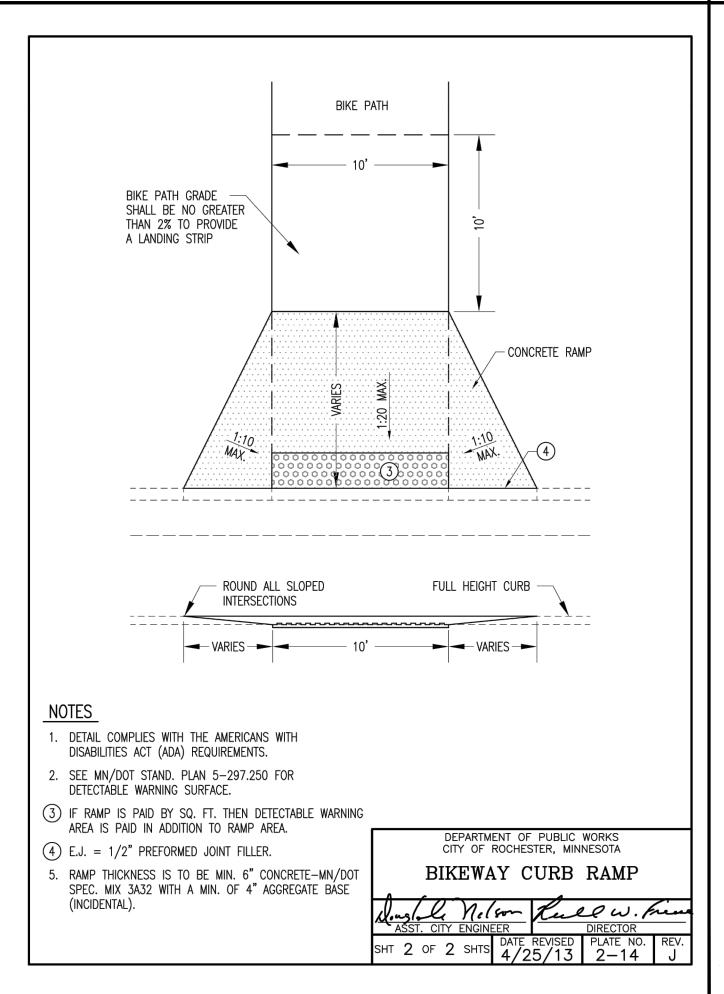


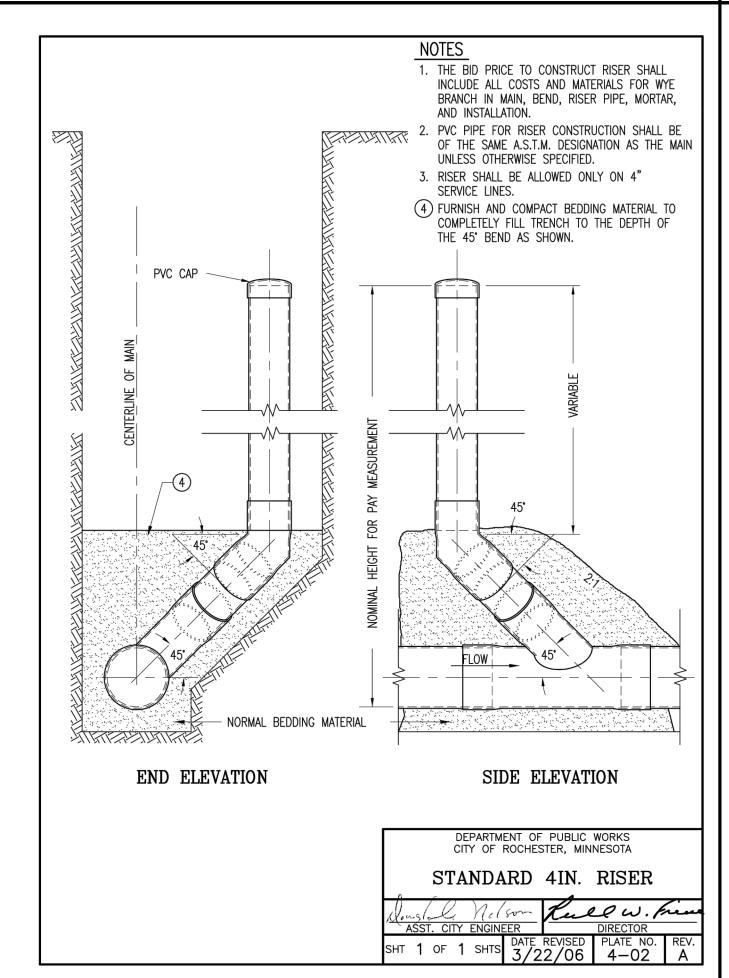


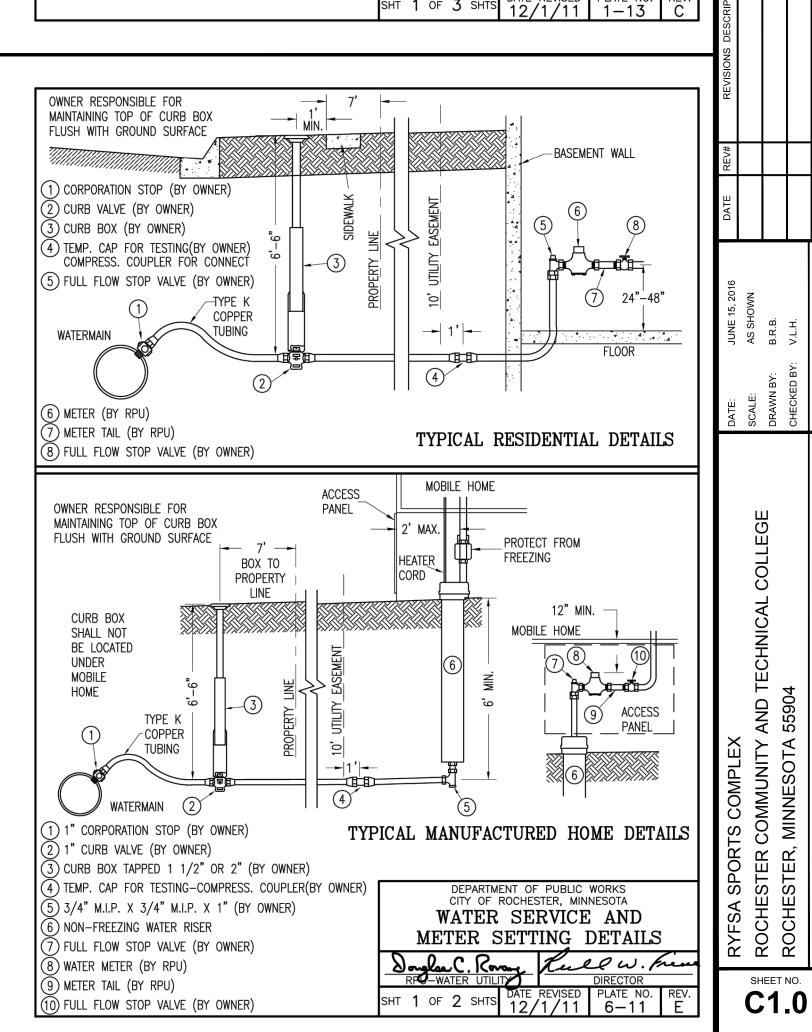
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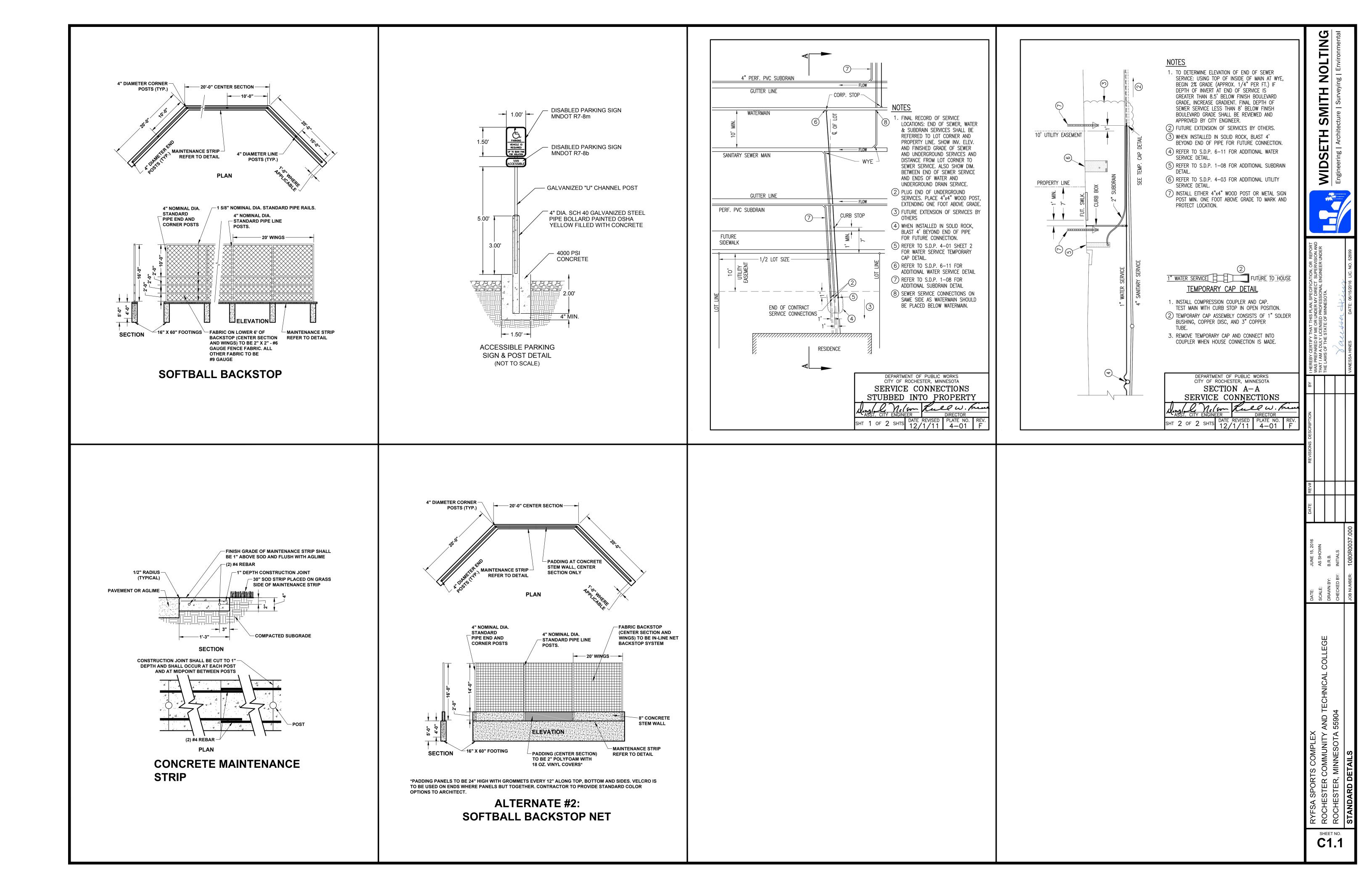
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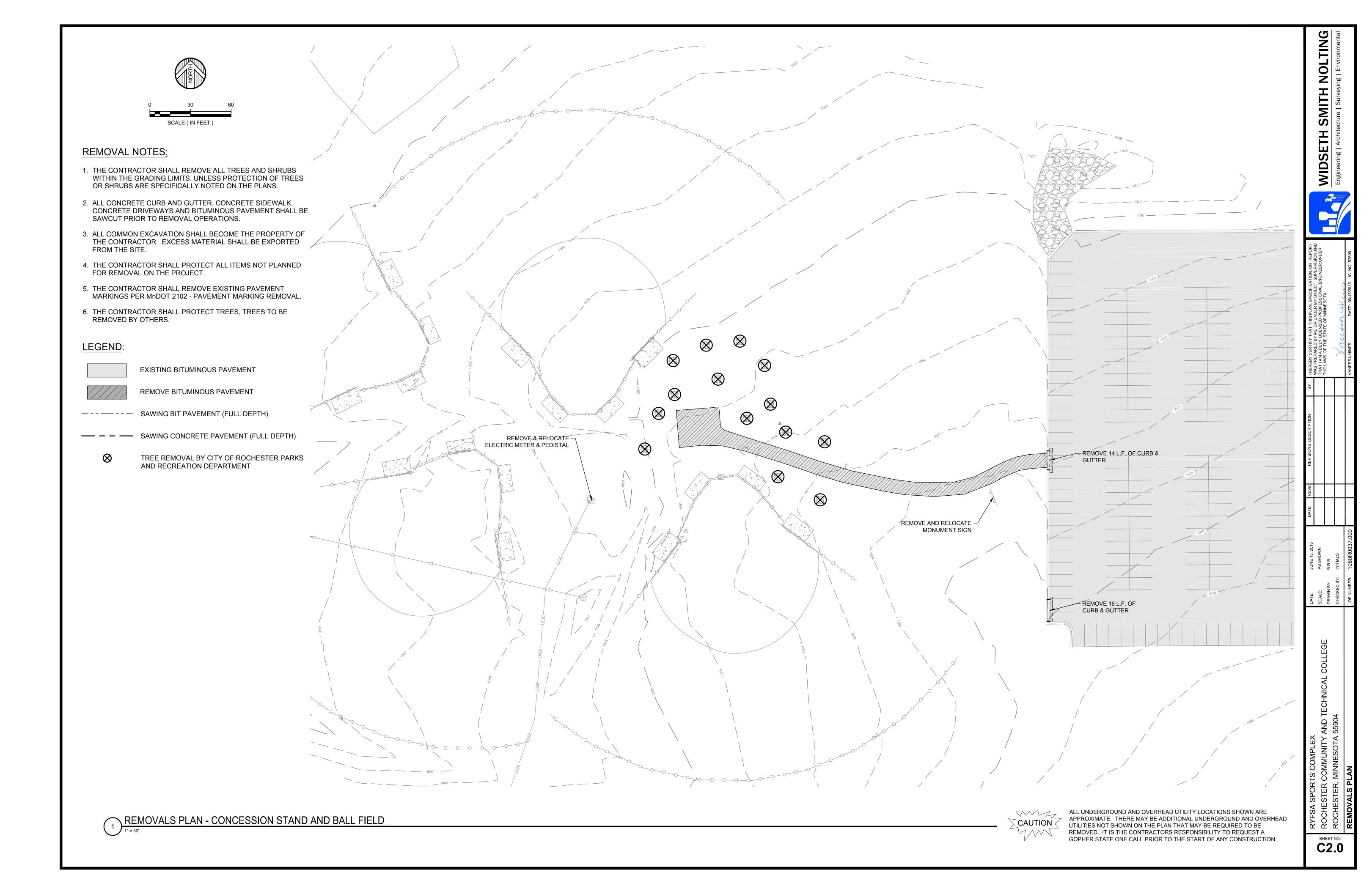


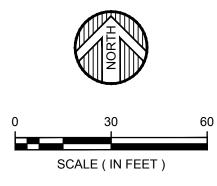












## SITE CAPACITY CALCULATIONS

PARCEL ID:	63.05.24.055309
ZONING DISTRICT:	MRD
PROPOSED USAGE:	AREA ACCESSORY
TOTAL LOT AREA:	3,791,820
TOTAL LOT ACREAGE:	87.05

FLOOR AREA RATIO :	0.40
MAX. ALLOWABLE FLOOR AREA:	1,516,728 SF
PROPOSED FLOOR AREA:	2,040 SF
MAX PERMITTED HEIGHT:	NONE
SETBACKS:	
FRONT YARD:	20 FT
SIDE YARD:	10 FT
REAR YARD:	12 FT
LANDSCAPE AREA:	20%
PROPOSED LANDSCAPE AREA:	89.5%
MIN. LOT SIZE:	NONE
EXTERIOR LIGHTING:	В
SIGN REGULATIONS:	В
EXTERIOR STORAGE:	T,A
	3.71

OFF STREET PARKING:	
EXISTING PARKING STALLS:	179 STALL
PROPOSED PARKING STALLS:	176 STALL

**BUFFERYARD INDICATOR:** 

DENOTES FENCE - CHAIN LINK					
DENOTES EXISTING STORM SEWER					
DENOTES EXISTING WATERMAIN					
DENOTES EXISTING UNDERGROUND ELECTRIC					
DENOTES PROPOSED SANITARY SERVICE					
DENOTES PROPOSED STORM SEWER					
DENOTES PROPOSED WATER SERVICE					
DENOTES PROPOSED ELECTRICAL CONDUIT					
DENOTES TREE CONIFER					
DENOTES TREE DECIDUOUS					
DENOTES DOUBLE SIGN POST					
DENOTES SANITARY MANHOLE					
DENOTES 4" SANITARY CLEANOUT					
DENOTES WATER CURB STOP					
DENOTES STORM INLET					
DENOTES STORM MANHOLE					
DENOTES ELECTRIC METER					
DENOTES ELECTRIC PEDISTAL					
DENOTES PROPOSED CONCRETE PAVING					
DENOTES PROPOSED BITUMINOUS PAVING					

PARCEL ID: 63.05.24.055309

OWNER:

SITE ADDRESS: 827 36TH AVENUE SE ROCHESTER, MINNESOTA 55904

> ROCHESTER COMMUNITY AND TECHNICAL COLLEGE 851 30TH AVENUE SE ROCHESTER, MINNESOTA 55904 CONTACT: SHAYNE JENSSON

PH: (507) 280-2955 ROCHESTER PARKS AND RECREATION 201 4TH STREET SE, ROOM 150 PROJECT LEAD: ROCHESTER, MINNESOTA 55904

CONTACT: MIKE NIGBUR

PH: (507) 328-2541 CIVIL ENGINEER: WIDSETH SMITH NOLTING 3777 40TH AVENUE NW, SUITE 200

ROCHESTER, MINNESOTA 55901 CONTACT: VANESSA HINES PH: (507) 292-8743

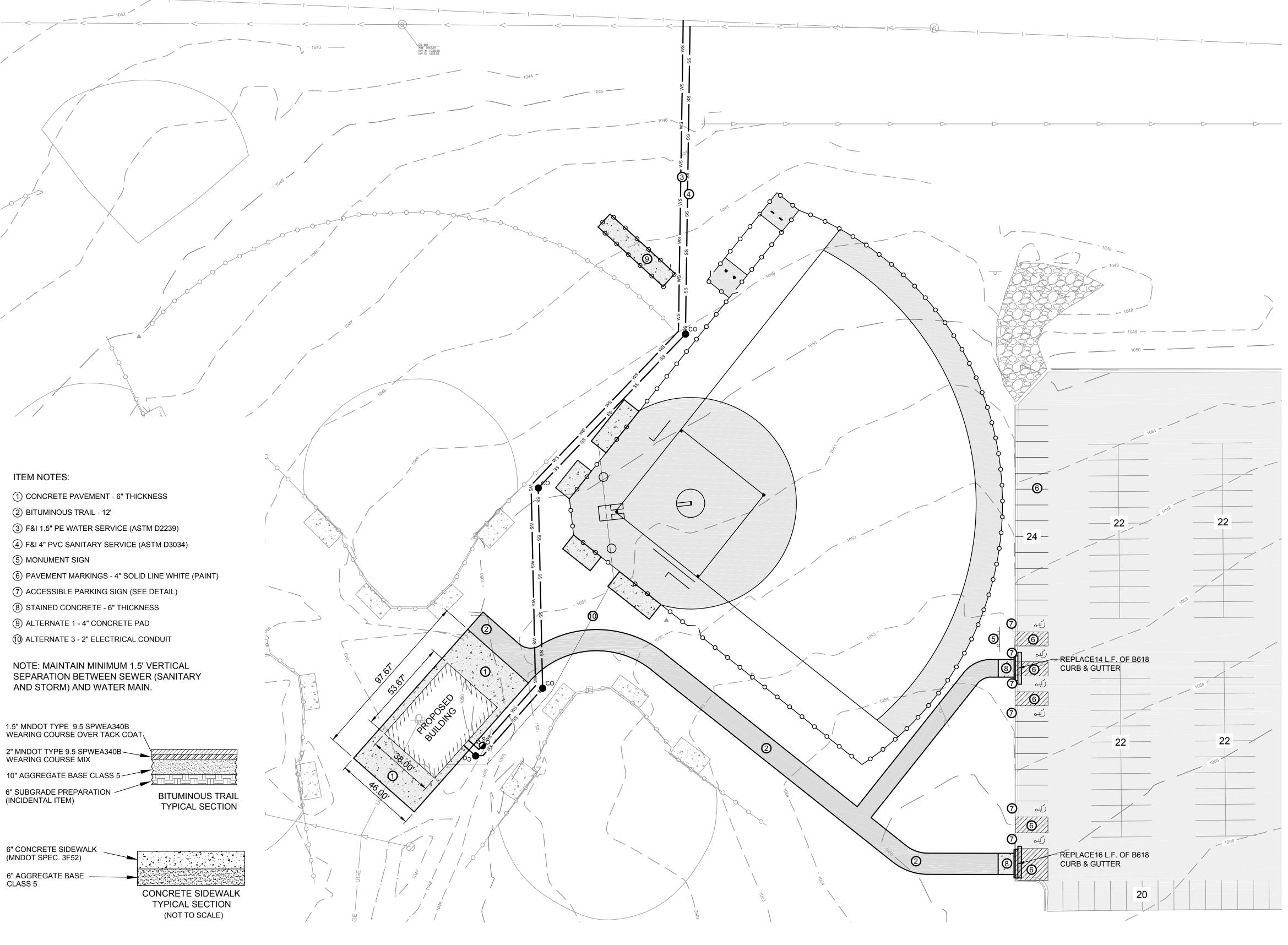
# ITEM NOTES:

- 1 CONCRETE PAVEMENT 6" THICKNESS
- 3 F&I 1.5" PE WATER SERVICE (ASTM D2239)
- (5) MONUMENT SIGN

SEPARATION BETWEEN SEWER (SANITARY AND STORM) AND WATER MAIN.

2" MNDOT TYPE 9.5 SPWEA340B~ WEARING COURSE MIX 10" AGGREGATE BASE CLASS 5 -6" SUBGRADE PREPARATION ~ (INCIDENTAL ITEM)

6" CONCRETE SIDEWALK (MNDOT SPEC. 3F52) 6" AGGREGATE BASE CLASS 5



SITE PLAN - CONCESSION STAND AND BALL FIELD

ALL UNDERGROUND AND OVERHEAD UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THERE MAY BE ADDITIONAL UNDERGROUND AND OVERHEAD UTILITIES NOT SHOWN ON THE PLAN THAT MAY BE REQUIRED TO BE REMOVED. IT IS THE CONTRACTORS RESPONSIBILITY TO REQUEST A GOPHER STATE ONE CALL PRIOR TO THE START OF ANY CONSTRUCTION.

MZ

CAUTION

SHEET NO. C3.0

RYFSA SPORTS ( ROCHESTER CON ROCHESTER, MIN SITE PLAN

SMITH NOLTING

ITEM NOTES:

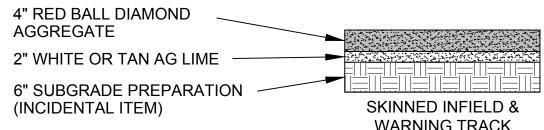
- 10' CHAINLINK FENCE
- ② BACKSTOP 16' CHAINLINK FENCE
- ③ 6" CONCRETE PAD
- WARNING TRACK
- (5) SKINNED INFIELD

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.

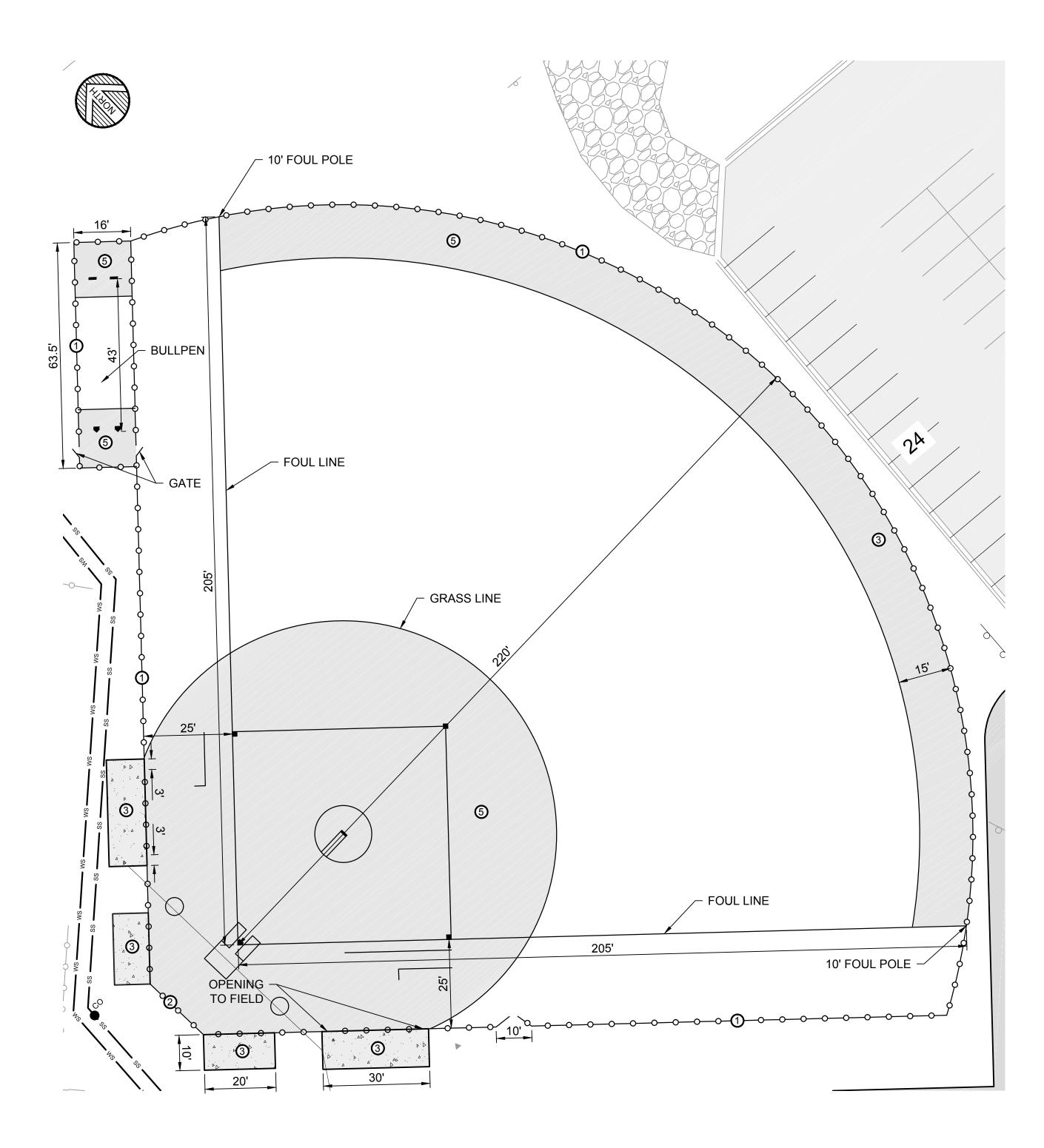
MnDOT STANDARD PLATES

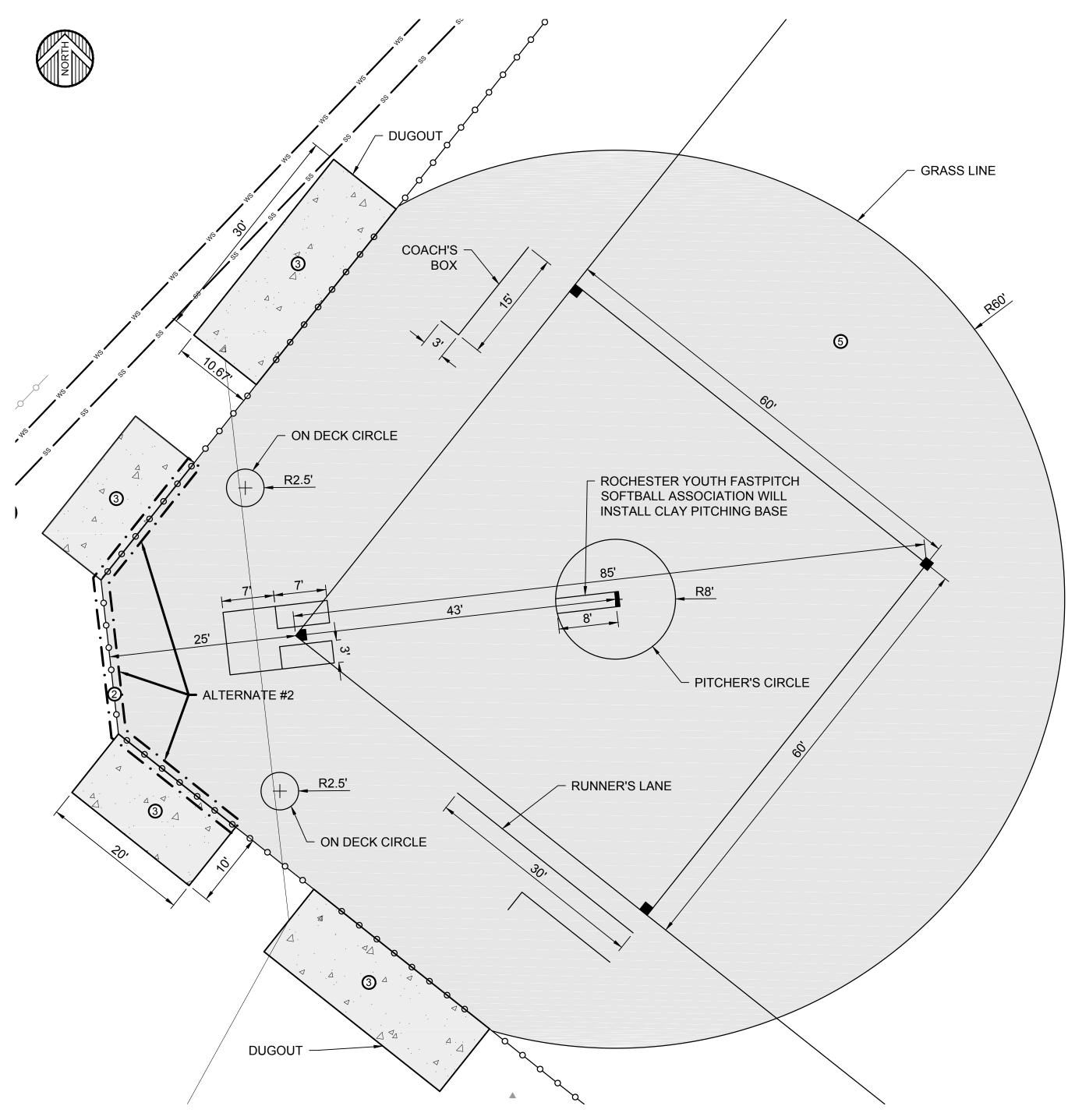
9322K CHAIN LINK FENCE: DESIGN 72-9322 WITH TOP RAIL

NOTE: BALL FIELD IS TO BE SIZED ACCORDING TO THE NCAA SOFTBALL RULES AND INTERPRETATIONS - RULE 2: FIELD OF PLAY AND SOFTBALL FIELD SPECIFICATIONS.



SKINNED INFIELD &
WARNING TRACK
TYPICAL SECTION
(NOT TO SCALE)





SMITH NOLTING

WIDSETH

# **GRADING & GENERAL NOTES:**

- 1. AN NPDES PERMIT SHALL BE APPLIED FOR BY THE OWNER AND CONTRACTOR IF DISTURBED AREA EXCEEDS 1 ACRE: AN NPDES PERMIT WILL BE REQUIRED FOR THIS PROJECT.
- ALL EROSION CONTROL AND SILTATION CONTROL SHALL COMPLY WITH THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA) WATER QUALITY IN URBAN AREAS MANUAL AND THE REGULATIONS OF THE CITY OF ROCHESTER AND OLMSTED COUNTY.
- SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP'S), WHICH PREVENT SEDIMENT FROM ENTERING A WATER OF THE STATE, SHALL BE ESTABLISHED BEFORE LAND DISTURBING OPERATIONS BEGIN AND SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS BEEN ESTABLISHED.

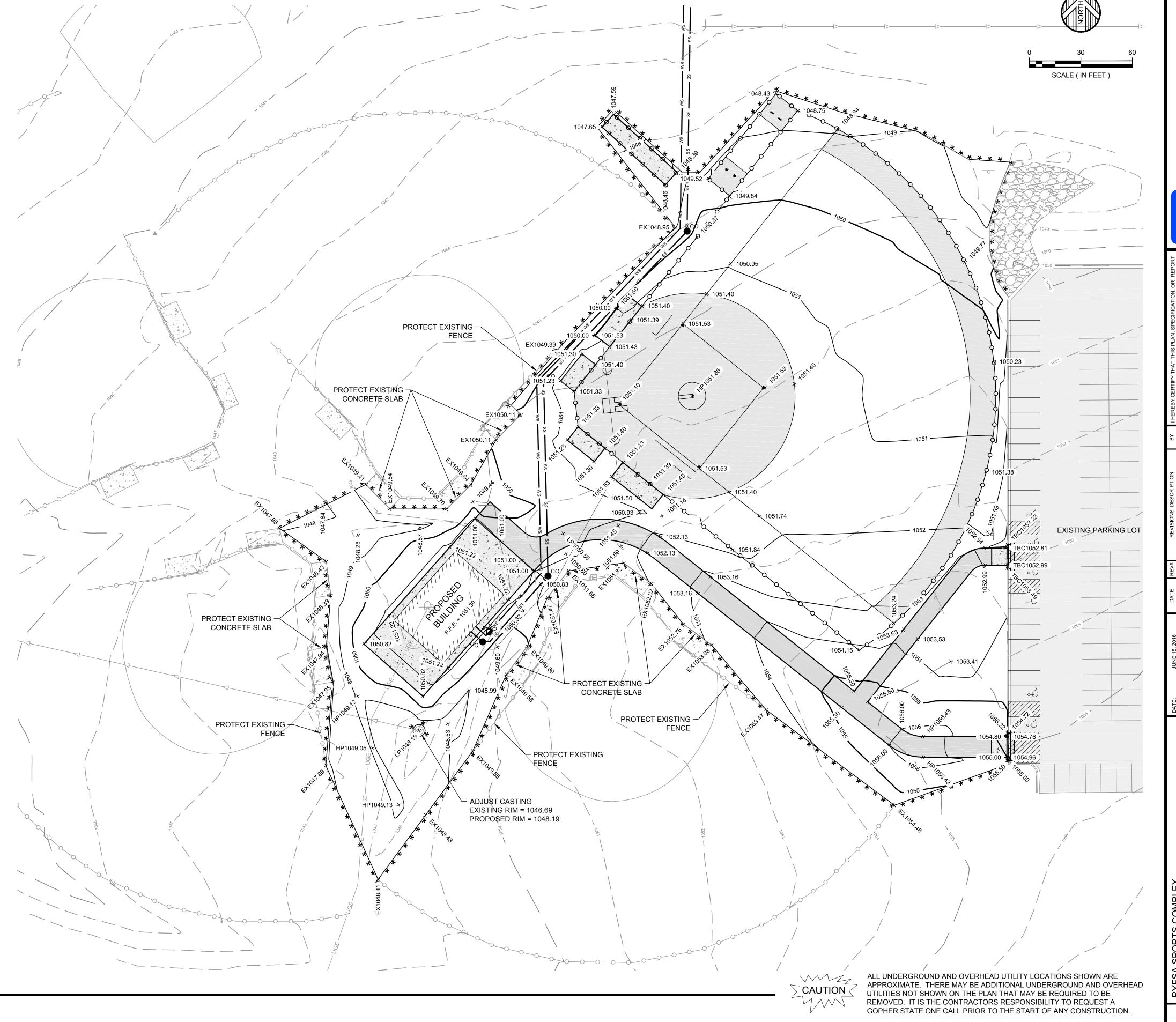
  SILT FENCE CITY OF ROCHESTER STANDARD PLATE 7-01B

  INLET PROTECTION CITY OF ROCHESTER STANDARD PLATE 7-05C

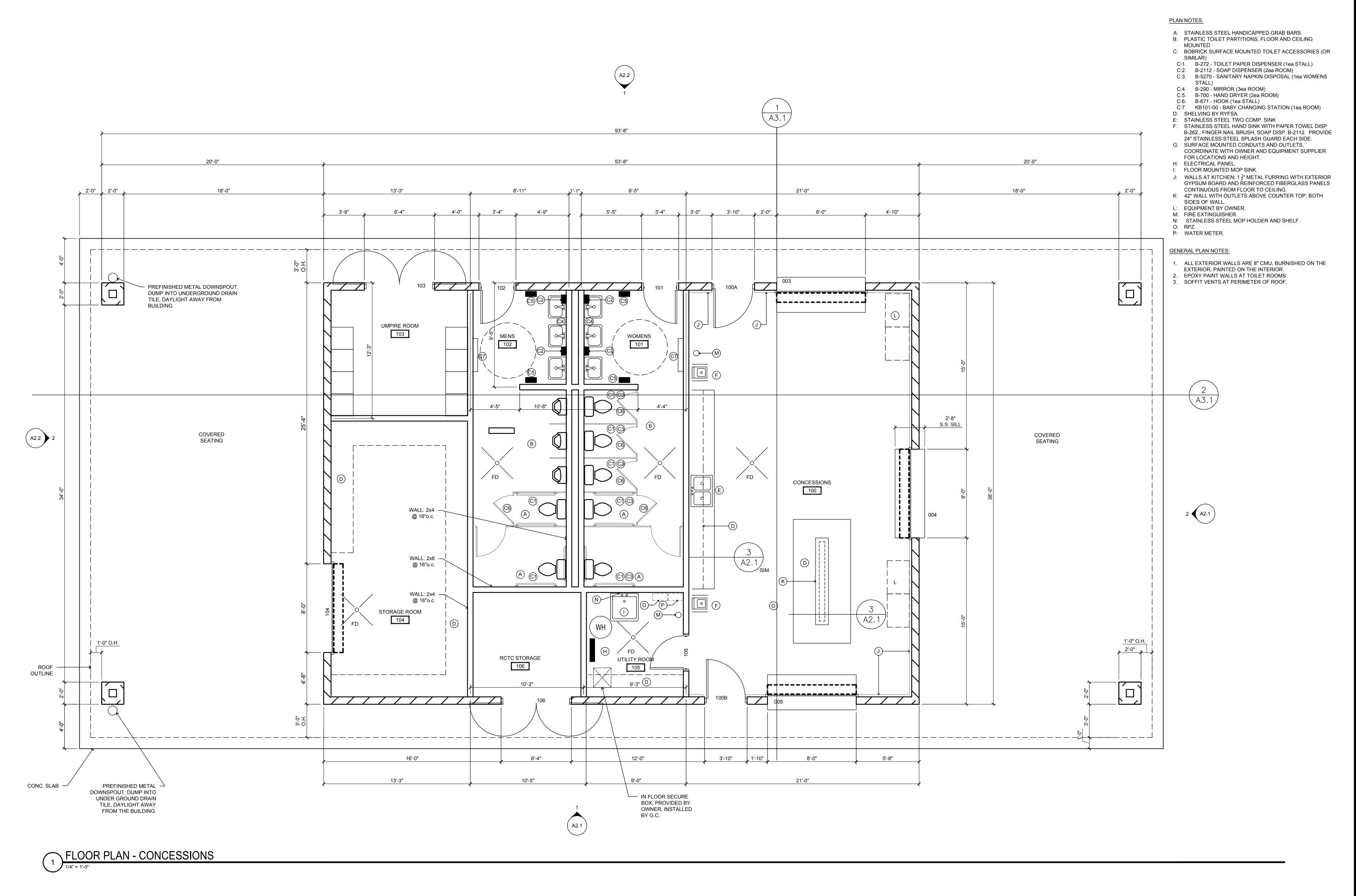
  TEMPORARY ROCK CONSTRUCTION ENTRANCE CITY OF ROCHESTER STANDARD PLATE 7-06D

  CONCRETE WASHOUT AREA MnDOT STANDARD PLATE
- 4. TEMPORARY STABILIZATION TOPSOIL STOCK PILES AND DISTURBED SOIL AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR AT LEAST 14 DAYS WILL BE STABILIZED WITH TEMPORARY SEEDING AND MULCH NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN THAT AREA. THE TEMPORARY SEED SHALL BE RYE (GRAIN) APPLIED AT THE RATE OF 100 LBS PER ACRE. AFTER SEEDING, EACH AREA SHALL BE MULCHED WITH TWO (2) TONS PER ACRE OF STRAW. THE STRAW MULCH IS TO BE TACKED INTO PLACE BY A DISK WITH THE BLADES SET NEARLY STRAIGHT.
- 5. ALL DISTURBED PERVIOUS AREAS SHALL BE HYDROSEEDED (MNDOT 25-151) UNLESS OTHERWISE NOTED OR SHOWN IN PLANS. ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE LATER THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SEEDING SHALL BE PER THE MNDOT SEEDING MANUAL.
- 6. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE THAT DRAINS WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE INTO ANY SURFACE WATER WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER.
- 7. PIPE OUTLETS MUST BE PROVIDED WITH TEMPORARY OR PERMANENT ENERGY DISSIPATION WITHIN 24 HOURS AFTER CONNECTION TO A SURFACE WATER OR OUTLET.
- 8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SEDIMENT DOES NOT LEAVE THIS SITE.
  IT IS REQUIRED THAT THE CONTRACTOR INSTALL A STABILIZED VEHICLE EXIT TO KEEP SEDIMENT TRACKING
  TO A MINIMUM. THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY UNTIL ACCEPTANCE OF THE
- 9. ANY DEPOSITING OF SEDIMENT OR DEBRIS ON NEW OR EXISTING PAVEMENT, OR IN EXISTING STORM SEWERS SHALL BE REMOVED AFTER EACH RAIN AND AFFECTED AREAS CLEANED. ANY TRACKING OF SEDIMENT OR DEBRIS FROM CONSTRUCTION TRAFFIC ONTO PUBLIC RIGHT OF WAY SHALL BE REMOVED BY THE END OF EACH WORK DAY AND AFFECTED AREAS CLEANED.
- 10. THE CONTRACTOR SHALL INSPECT THE CONSTRUCTION SITE ONCE EVERY SEVEN DAYS AND WITHIN 24 HOURS AFTER RAIN EVENTS FOR DAMAGE TO EROSION CONTROL DEVICES. IF DAMAGED OR INEFFECTIVE EROSION CONTROL DEVICES ARE DISCOVERED, THEY SHALL BE REPAIRED OR REPLACED. THE CONTRACTOR SHALL MAINTAIN INSPECTION RECORDS, WHICH INCLUDE DATE AND TIME OF INSPECTIONS, DATES OF RAINFALL EVENTS, FINDINGS OF INSPECTIONS, CORRECTIVE ACTIONS TAKEN (INCLUDING DATES AND TIMES), AND DOCUMENTATION OF ANY CHANGES TO THE TEMPORARY OR PERMANENT EROSION CONTROL PLANS MADE DURING CONSTRUCTION.
- 11. STORM WATER RUNOFF FROM THE FIELD WILL BE COLLECTED IN THE PONDING BASIN NORTH OF THE PARKING LOT. STORMWATER RUNOFF FROM THE BUILDING SITE WILL BE COLLECTED IN THE EXISTING STORM SEWER ON THE SITE. THE STORMWATER WILL INFILTRATE AND EVENTUALLY OUTLET TO THE POND IN THE NORTHWEST CORNER OF THE PARCE!
- 12. CONTRACTOR IS RESPONSIBLE FOR ALL SITE CLEARING, GRUBBING AND REMOVALS WHICH WILL INCLUDE THE FOLLOWING: BITUMINOUS PAVEMENT, CURB AND GUTTER, LANDSCAPING AND TREES. THE CONTRACTOR SHALL COORDINATE UTILITY WORK WITH THE LOCAL UTILITY COMPANIES AND LIGHTING CONTRACTOR (SEPARATE CONTRACT).
- REMOVAL OF PAVEMENT AND MISCELLANEOUS STRUCTURES SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF MN/DOT 2104.
- 13. ALL PROPOSED ELEVATIONS ARE TO TOP OF PAVING OR FINISHED GRADE, UNLESS NOTED OTHERWISE. PROPOSED ELEVATIONS ARE INTENDED TO PROVIDE POSITIVE DRAINAGE TOWARDS CATCH BASINS AND/OR OUTLETS. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE REQUIRED ELEVATIONS, WHICH WILL PROMOTE POSITIVE DRAINAGE THROUGHOUT THE PROJECT SITE.
- 14. THE SITE HAS NOT NECESSARILY BEEN DESIGNED TO BALANCE THE ON-SITE MATERIALS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EARTHWORK QUANTITY ON THIS SITE. EXCESS MATERIAL, IF ANY SHALL BE DISPOSED OF OFF-SITE. THE CONTRACTOR SHALL IMPORT SUITABLE MATERIAL
- 15. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE CITY DEPARTMENTS AND UTILITY COMPANIES 72 HOURS PRIOR TO CONSTRUCTION. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING UTILITIES.
- 16. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION.
- 17. SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
- 18. CONTRACTOR TO MAINTAIN 2.0% MAX. CROSS SLOPE ON ALL SIDEWALK.
- 19. PROVIDE A 2 FOOT TAPER SECTION ON ALL CURB TERMINI UNLESS OTHERWISE NOTED.
- 20. MAINTAIN MINIMUM 1.5' VERTICAL SEPARATION BETWEEN SEWER (SANITARY AND STORM) AND WATER MAIN.

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DSETH SMITH NOLTING sering | Architecture | Surveying | Environments

DATE REV# REVISIONS DESCRIPTION BY IHEREBY CERTIFY THAT THIS PLAN, S
WAS PREPARED BY ME OR UNDER MY
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STATE OF MINNESOTA.

STATE OF MINNESOTA.

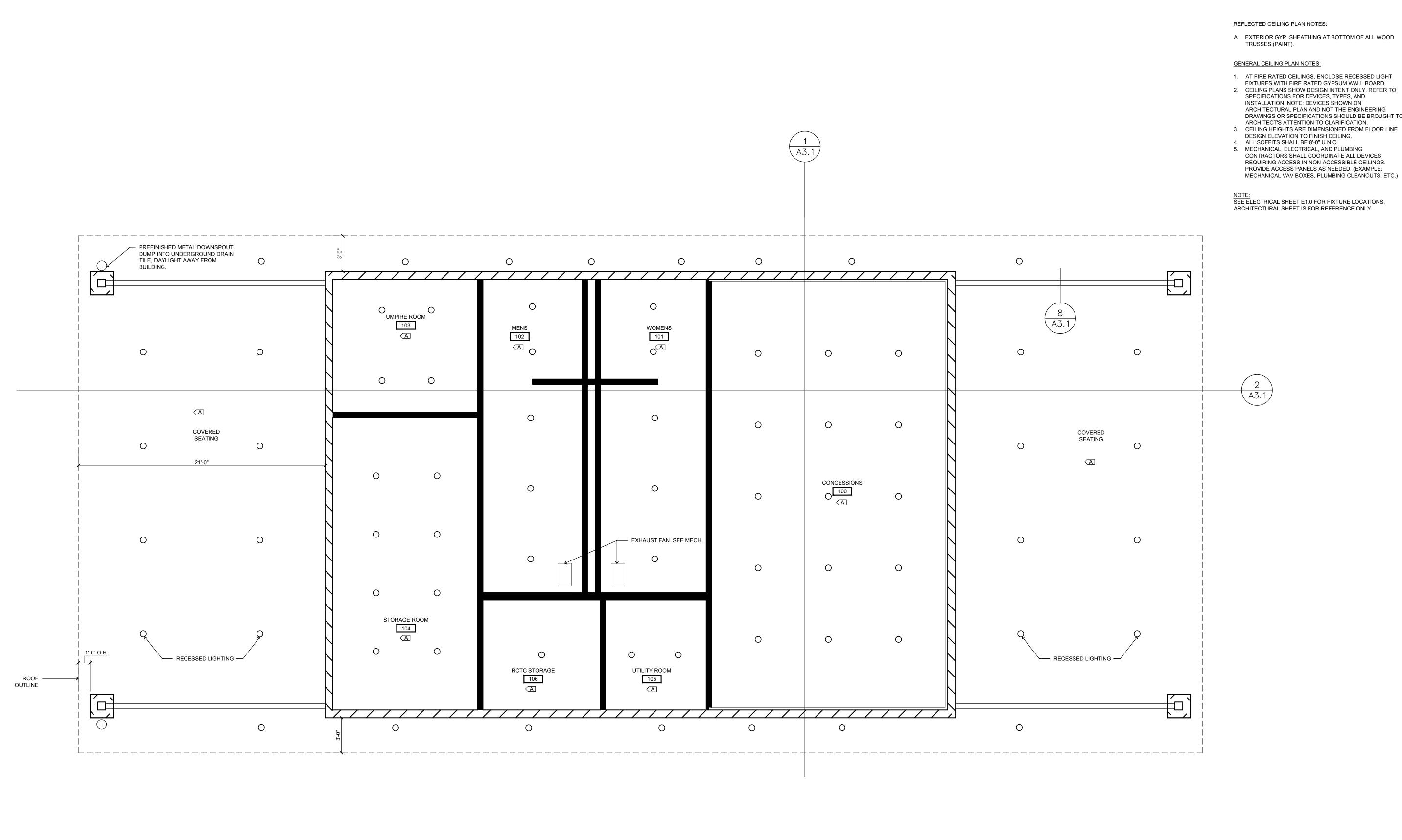
DANAJ. HLEBICHUK DATE: 06

ER COMMUNITY AND TECHNICAL COLLEGE
ER, MINNESOTA 55904

RYFSA SPORTS COMF ROCHESTER COMMUI ROCHESTER, MINNES

SHEET NO.

**A1.1** 



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ARCHITECTURAL PLAN AND NOT THE ENGINEERING DRAWINGS OR SPECIFICATIONS SHOULD BE BROUGHT TO

REQUIRING ACCESS IN NON-ACCESSIBLE CEILINGS. MECHANICAL VAV BOXES, PLUMBING CLEANOUTS, ETC.)

REFLECTED CEILING PLAN - CONCESSIONS

1/4" = 1'-0"

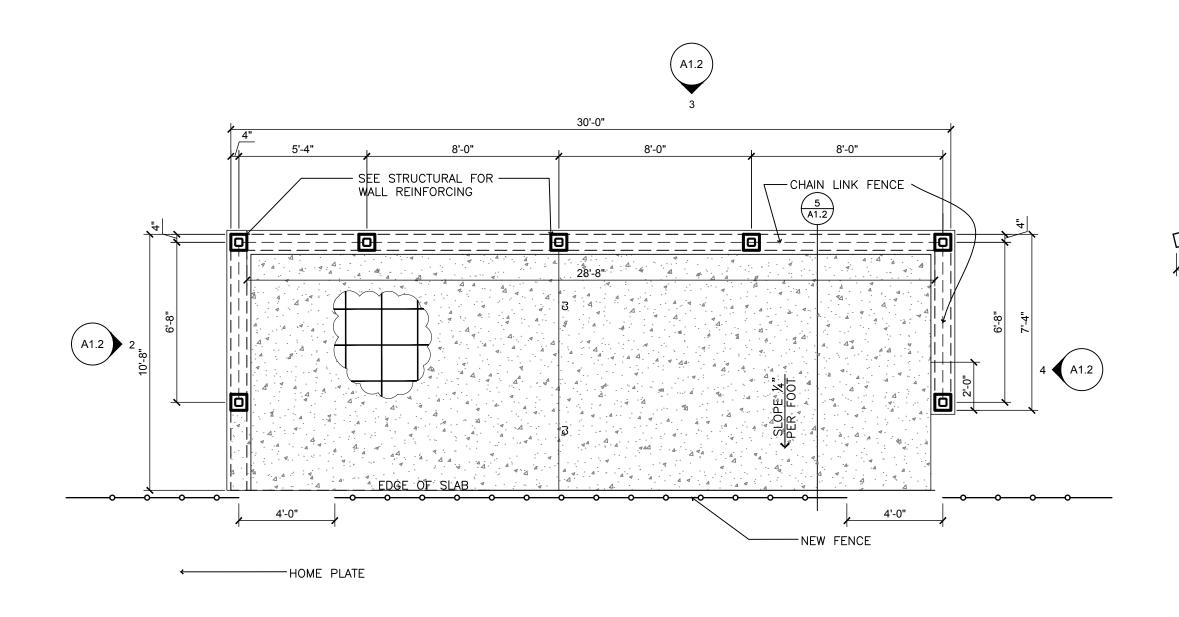


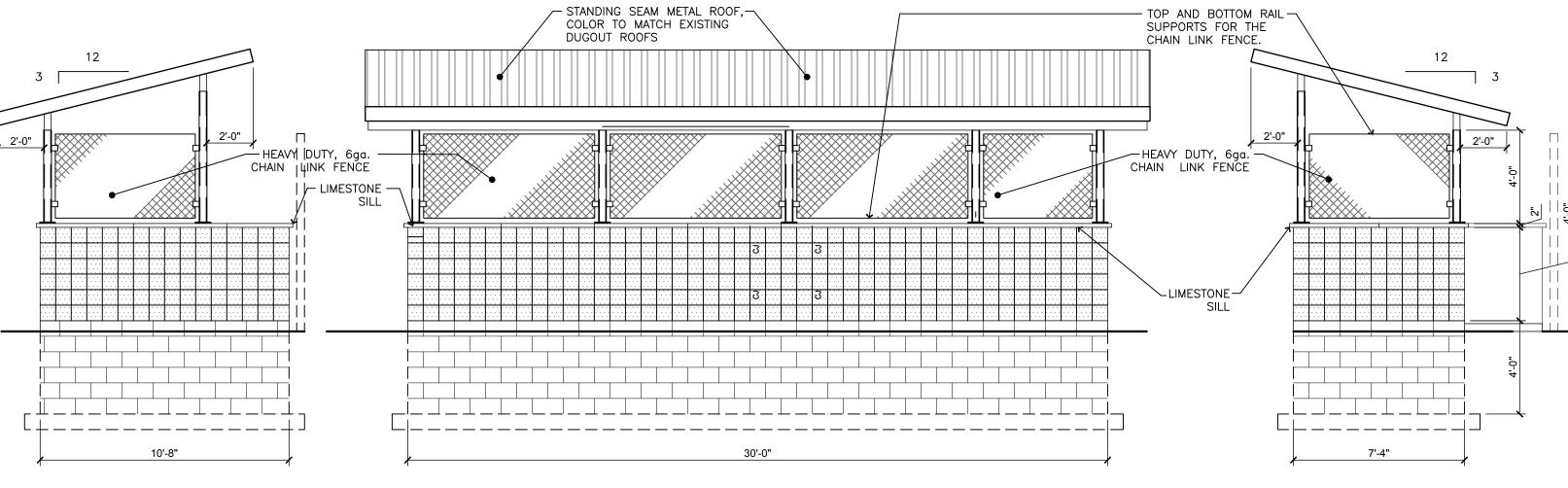




ELEVATIONS - DUGOUT

SHEET NO. **A1.3** 





1 FLOOR PLAN - DUGOUT

2 ELEVATIONS - DUGOUT
1/4" = 1'-0"

3 ELEVATIONS - DUGOUT

1/4" = 1'-0"

ROOF ASSEMBLY:

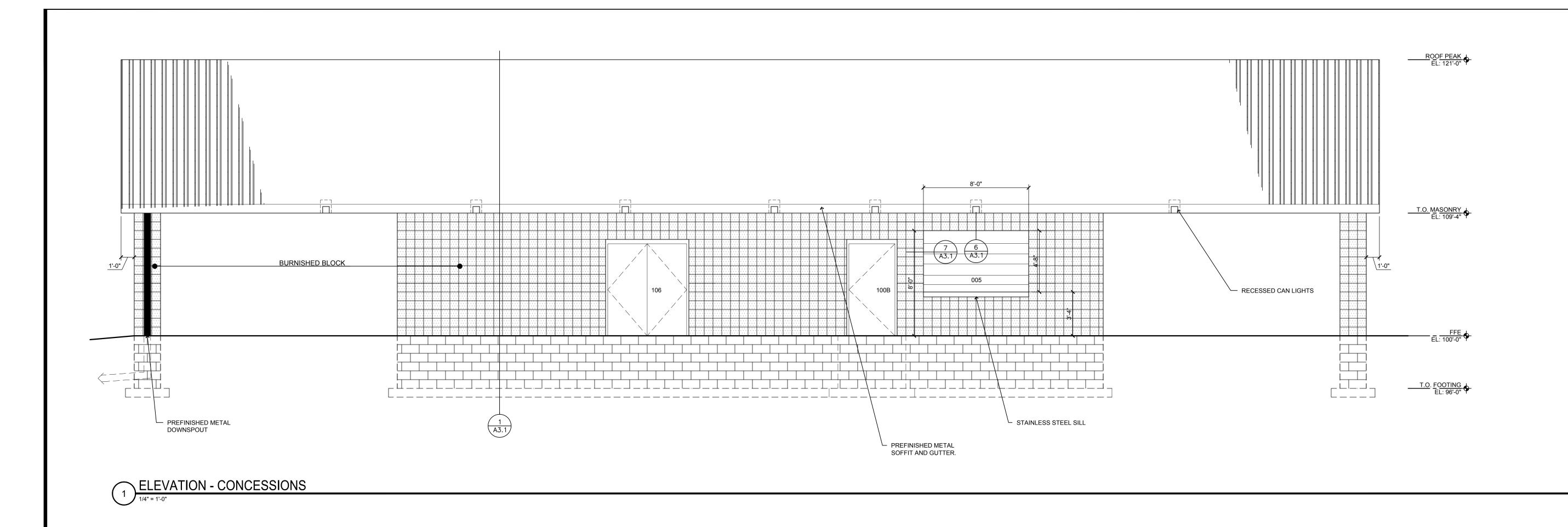
PREFINISHED 24ga. STANDING SEAM METAL ROOF, (SIMILAR TO PAC CLAD EDGE-LOC)

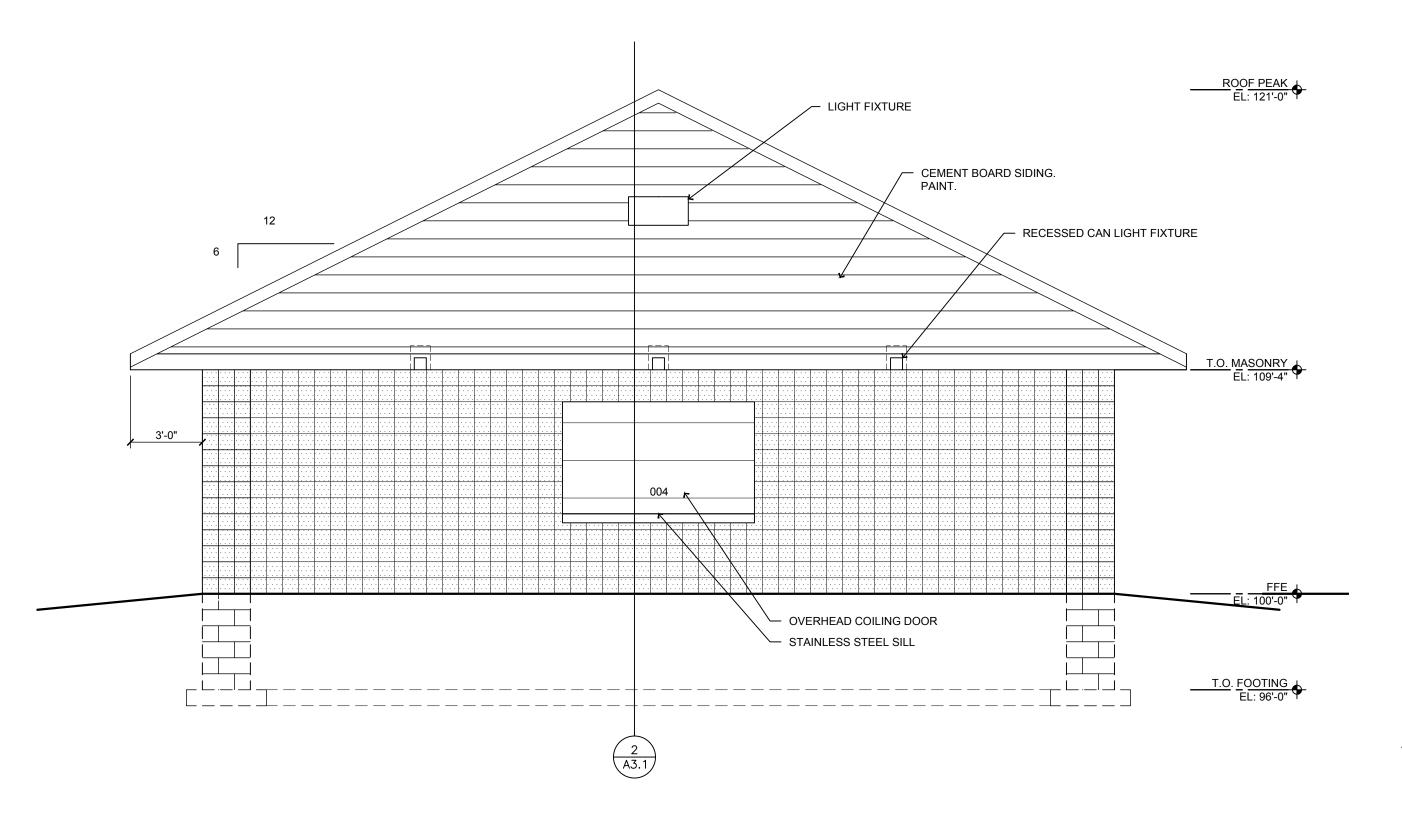
30# ROOF FELT

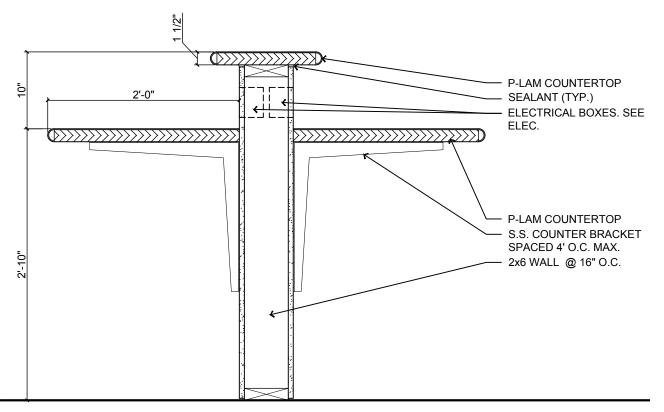
2" OSB SHEATHING 3% SPAN RATING 2'-0" • 2x6 @ 24"o.c. - STEEL COLUMN, PAINT - LIMESTONE SILL - FOOTINGS. SEE STRUCTURAL.

SECTION - DUGOUT

3/8" = 1'-0"







ELEVATION - CONCESSIONS

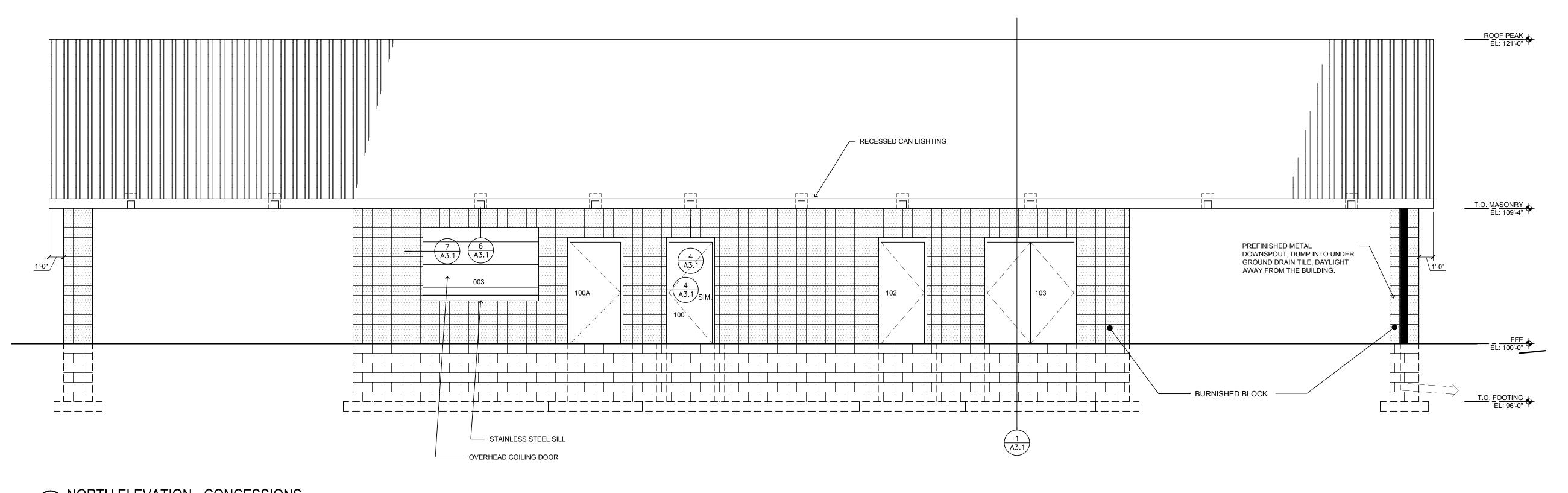
KITCHEN COUNTER SECTION

WIDSETH SMITH NOLTING

Engineering | Architecture | Surveying | Environmental

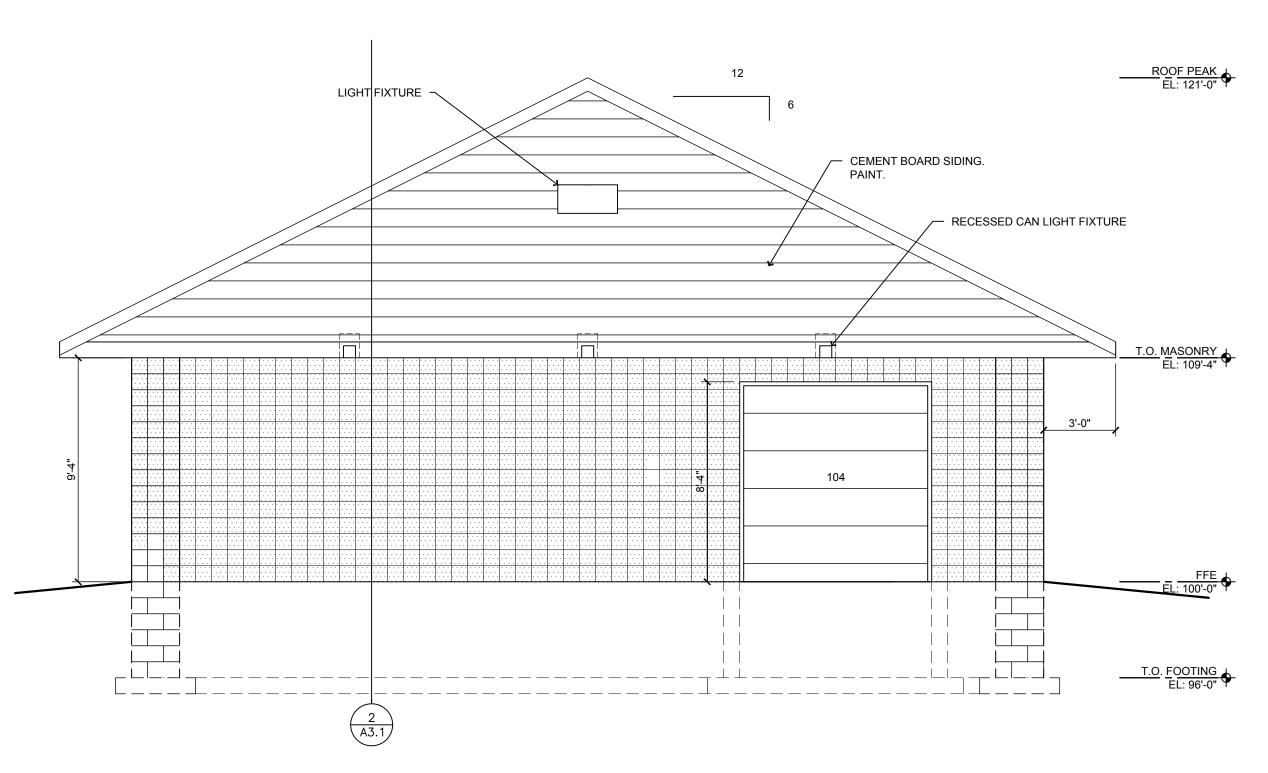
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PORTS COMPLEX	DATE:	JUNE 15, 2016	DATE	REV#	REVISIONS DESCRIPTION	ВУ	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICA
TED COMMINITY AND TECHNICAL COLLECE	SCALE:	AS SHOWN					WAS PREPARED BY ME OR UNDER MY DIRECT (THAT I AM A DULY LICENSED ARCHITECT UNDER
	DRAWN BY:	ARS					SIAIE OF MINNESOIA.
SLEK, MINNESOLA 55904	CHECKED BY: DJH	ЫН					and Malah
IONS & DETAIL - CONCESSIONS	JOB NUMBER:	JOB NUMBER: 1080R0037.000					DANAJ. HLEBICHUK DATE: 06/15/2016



NORTH ELEVATION - CONCESSIONS

1/4" = 1'-0"



ROOM	ROOM NAME	FLOOR	BASE	N. WALL	S. WALL	E. WALL	W. WALL		CEILING		COMMENTS
NUMBER	ROOM NAME	FINISH	BASE	FINISH	FINISH	FINISH	FINISH	MATERIAL	FINISH	HEIGHT	COMMENTS
100	CONCESSIONS	QUARRY TILE	QUARRY TILE	R.F.P.	R.F.P.	R.F.P.	R.F.P.	GWB	PT-1	9'-4"	
101	WOMEN'S RESTROOM	CONC	NONE	R.F.P.	R.F.P.	R.F.P.	R.F.P.	GWB	GWB PT-1		
102	MEN'S RESTROOM	CONC	NONE	R.F.P.	R.F.P.	R.F.P.	R.F.P.	GWB	PT-1	9'-4"	
103	UMPIRE ROOM	CONC	NONE	NONE	PT-1	PT-1	NONE	GWB	PT-1	9'-4"	
104	STORAGE	CONC	NONE	PT-1	NONE	PT-1	NONE	GWB	PT-1	9'-4"	
105	UTILITY ROOM	QUARRY TILE	QUARRY TILE	PT-1	NONE	PT-1	PT-1	GWB	PT-1	9'-4"	
106	RCTC STORAGE	CONC	NONE	PT-1	PT-1	PT-1	PT-1	GWB	PT-1	9'-4"	

R.F.P.: REINFORCED FIBERGLASS PANEL W/ 5/8" TYPE "X" GWB

						CC	ONCESSIONS -	DOOR SCHEDULI	E					
ROOM	DOOM NAME	DOOR	HARDWARE			Γ	DOOR				FRAME		FIDE DATING	COMMENTO
NUMBER	ROOM NAME	NUMBER	SET	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	FIRE RATING	COMMENTS
100	CONCESSIONS	100A	1	3'-0"	7'-0"	0'-1 3/4"	IM-1	IM	PT-2	HM-1	НМ	PT-2	N/A	
100	CONCESSIONS	100B	1	3'-6"	7'-0"	0'-1 3/4"	IM-1	IM	PT-2	HM-1	НМ	PT-2	N/A	
100	CONCESSIONS	003	BY MFGR.	8'-0"	4'-8"		COIL O.H.		NONE			NONE	N/A	
100	CONCESSIONS	004	BY MFGR.	8'-0"	4'-8"		COIL O.H.		NONE			NONE	N/A	
100	CONCESSIONS	005	BY MFGR.	8'-0"	4'-8"		COIL O.H.		NONE			NONE	N/A	
101	WOMEN'S RESTROOM	101	2	3'-0"	7'-0"	0'-1 3/4"	IM-2	IM	PT-2	HM-1	НМ	PT-2	N/A	
102	MEN'S RESTROOM	102	2	3'-0"	7'-0"	0'-1 3/4"	IM-2	IM	PT-2	HM-1	НМ	PT-2	N/A	
103	UMPIRE ROOM	103	1A	6'-0"	7'-0"	0'-1 3/4"	IM-1	IM	PT-2	HM-1	НМ	PT-2	N/A	
104	STORAGE	104	BY MFGR.	8'-0"	8'-0"		COIL O.H.		NONE			NONE	N/A	
105	UTILITY ROOM	105	1	3'-0"	7'-0"	0'-1 3/4"	IM-1	IM	PT-2	HM-1	НМ	PT-2	N/A	
106	RCTC STORAGE	106	1A	6'-0"	7'-0"	0'-1 3/4"	IM-1	IM	PT-2	HM-1	НМ	PT-2	N/A	

GROUP 1: STOREROOM FUNCTION, NO CLOSER.

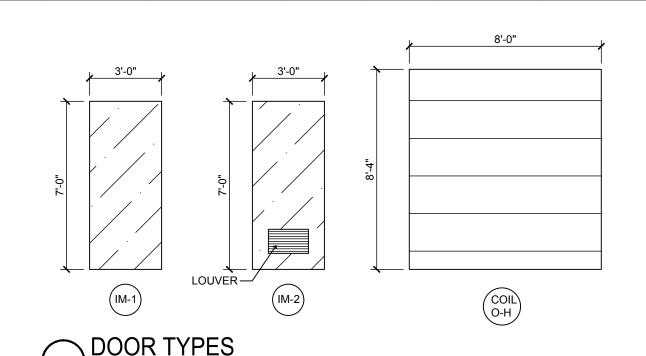
HINGES: 1 EACH.
LOCKSET:STOREROOM FUNCTION
FUNCTION: LATCHBOLT RETRACTED BY LEVER INSIDE ONLY. OUTSIDE LEVER IS ALWAYS RIGID. KEY OUTSIDE RETRACTS LATCHBOLT. DEADLOCKING LATCHBOLT. 1 EACH STOP.

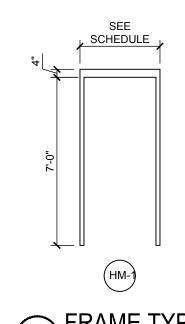
GROUP 1A: STOREROOM FUNCTION, NO CLOSER. HINGES: 1 EACH. 180 DEGREE.

LOCKSET: STOREROOM FUNCTION. FUNCTION: LATCHBOLT RETRACTED BY LEVER INSIDE ONLY. OUTSIDE LEVER IS ALWAYS RIGID. KEY OUTSIDE RETRACTS LATCHBOLT. DEADLOCKING LATCHBOLT. 1 EACH STOP.

GROUP 2: PUSH-PULL FUNCTION, NO CLOSER. HINGES: HEAVY DUTY. 1 EACH.

LOCKSET: DEADBOLT FUNCTION.
FUNCTION: DEADBOLT RETRACTED BY KEY INSIDE AND OUTSIDE. 1 EACH STOP.





FRAME TYPES

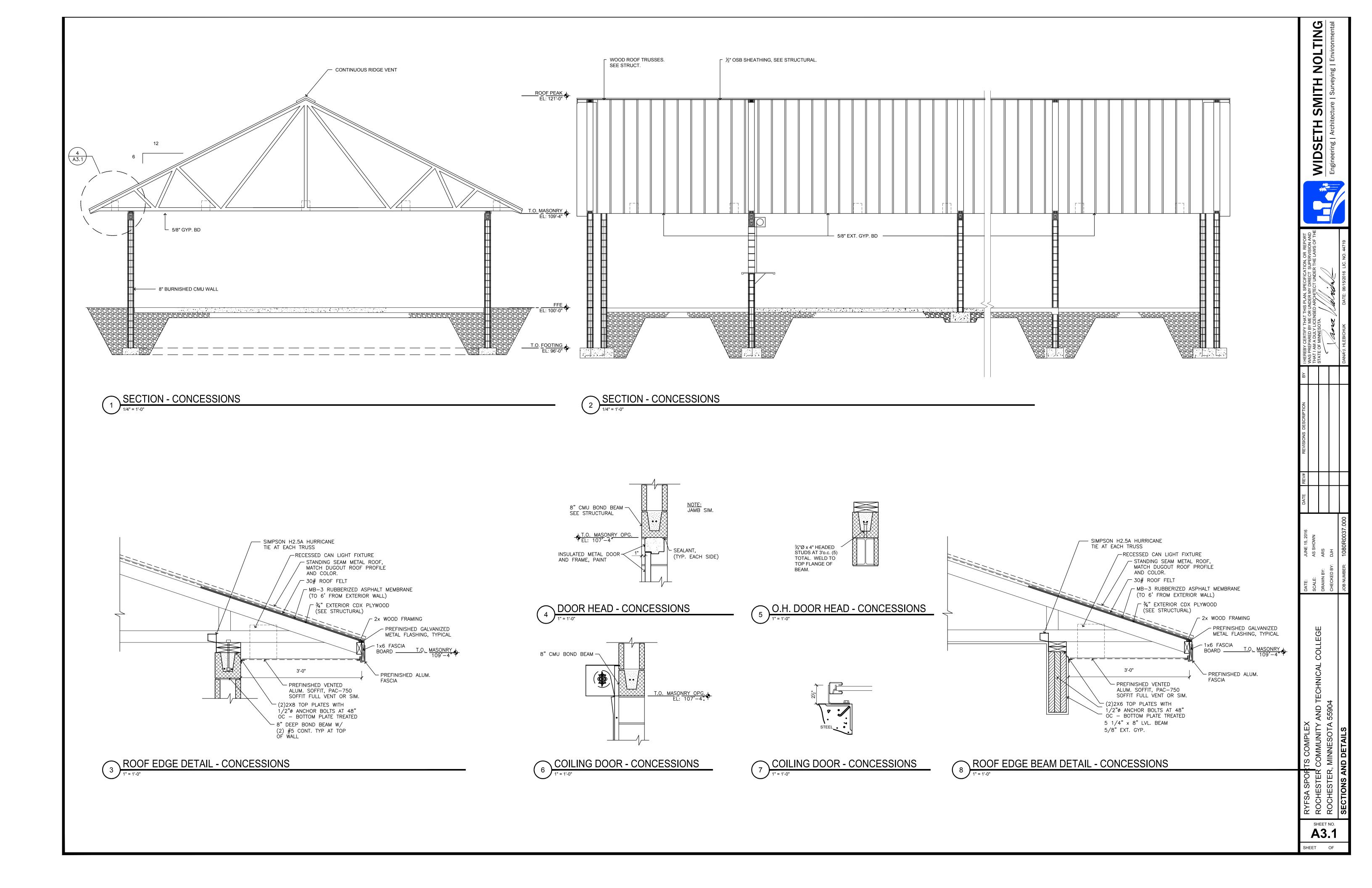
1/4" = 1'-0"

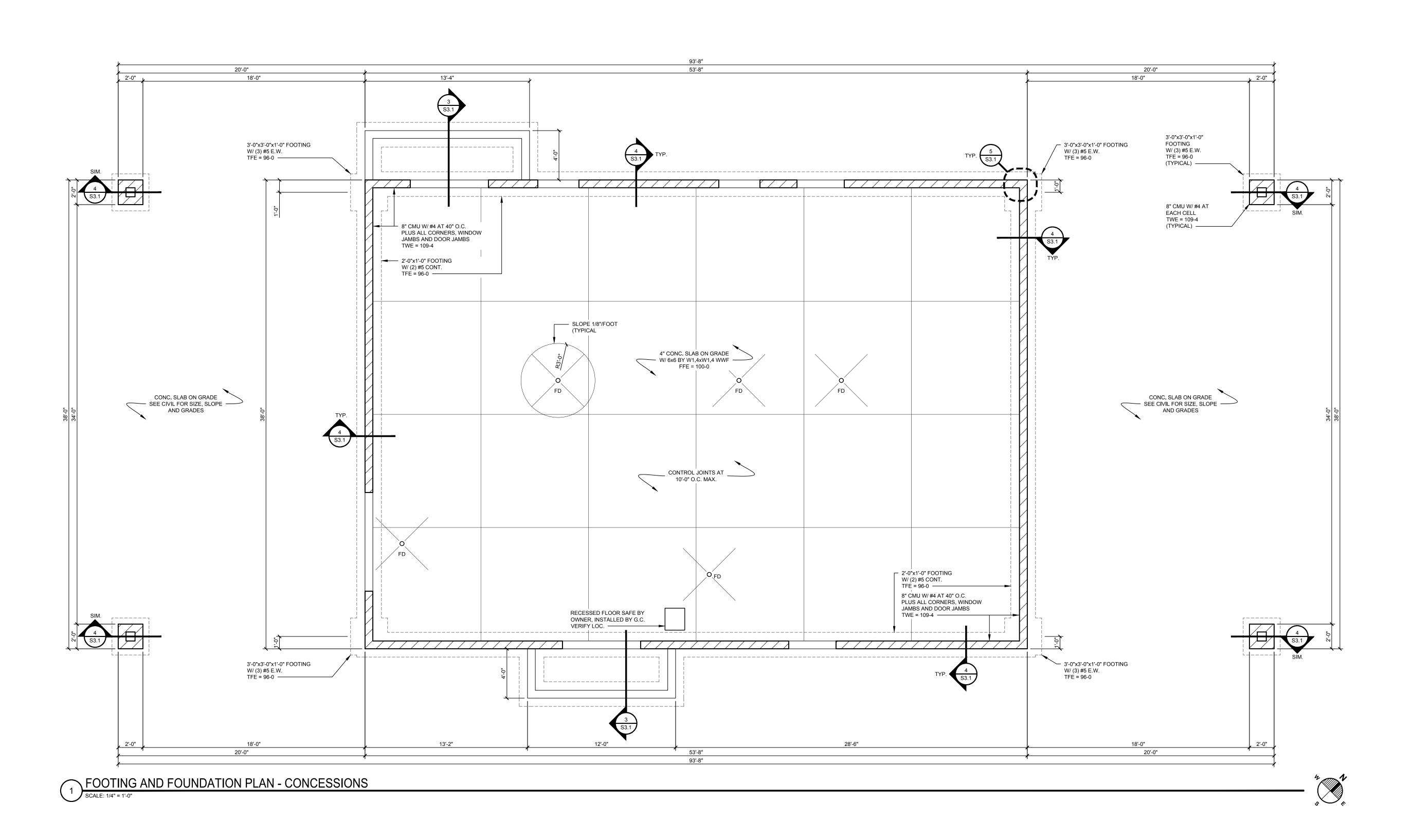
SMITH NOLTING

WIDSETH (Engineering | Architect

ELEVATION - CONCESSIONS

1/4" = 1'-0"



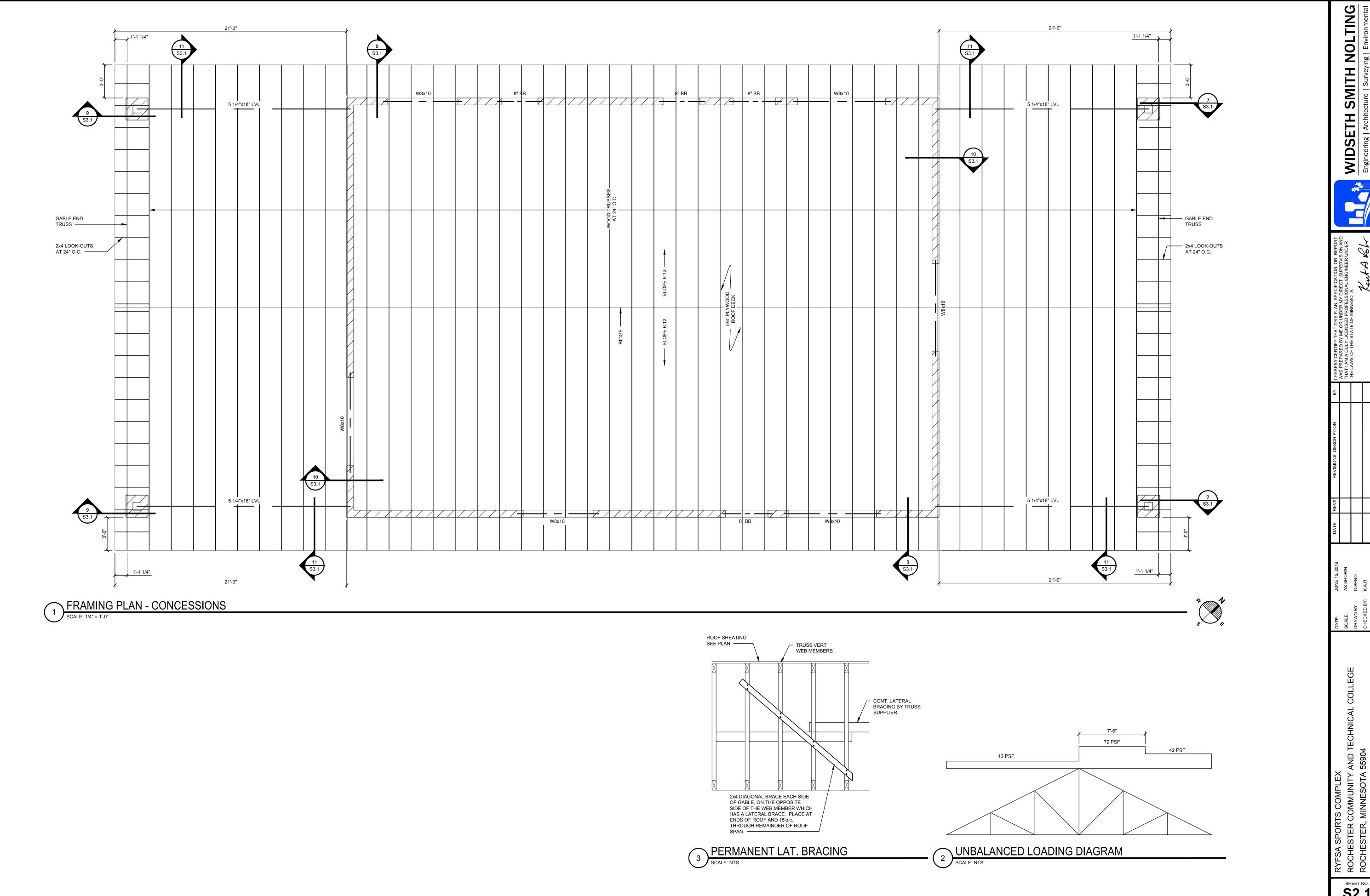


A SPORTS COMPLEX ESTER COMMUNITY AND ESTER, MINNESOTA 559

SMITH NOLTING

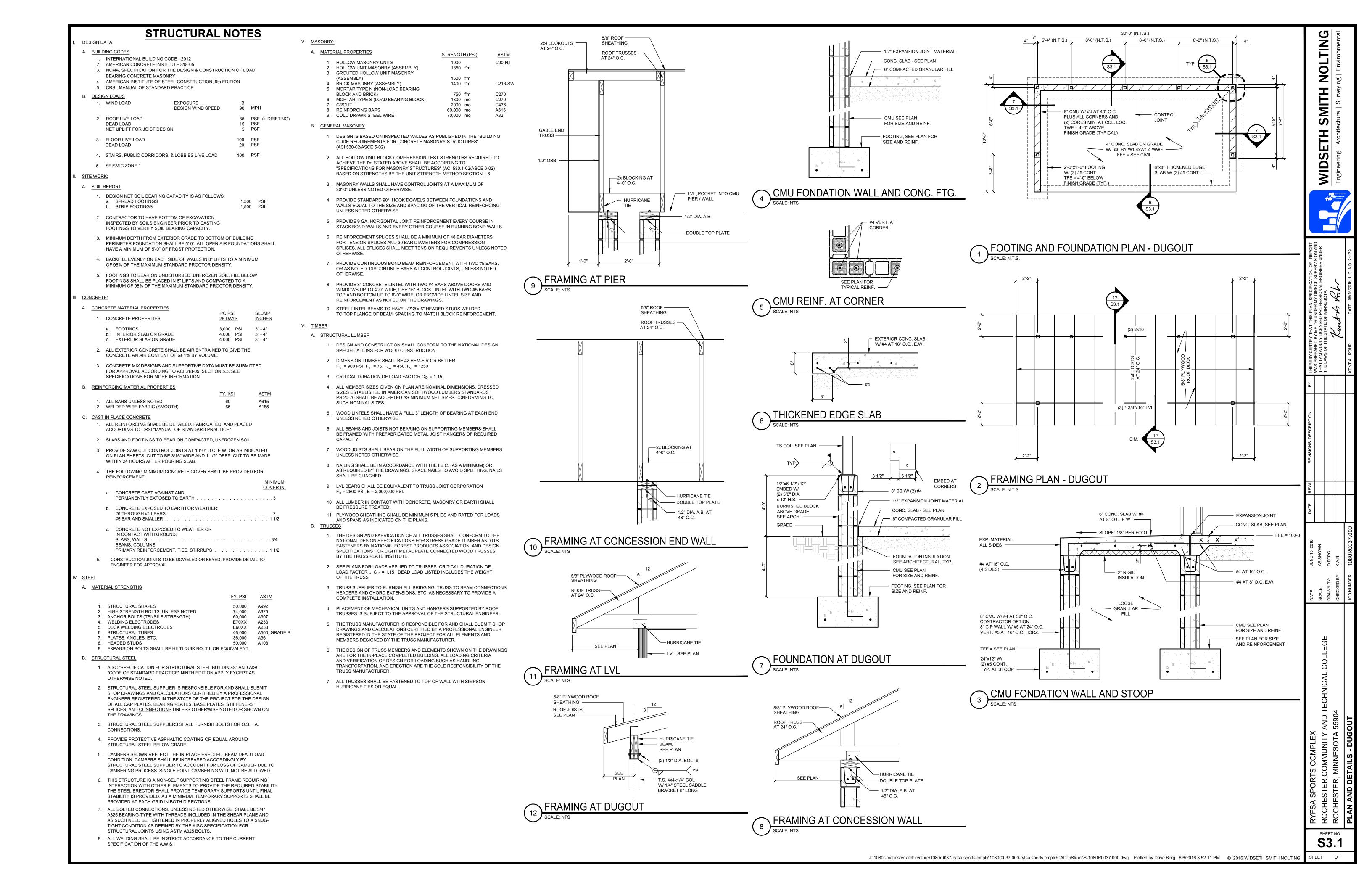
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SHEET NO. **\$1.1** 



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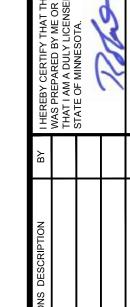
S2.1



	5	ABBREVIATIO	143
AD	AREA DRAIN	INSUL	INSULATION
A.F.F.	ABOVE FINISHED FLOOR	INV	INVERT
AFMS	AIR FLOW MEASURING STATION	KW	KILOWATT
AHU	AIR HANDLING UNIT	LAT	LEAVING AIR TEMPERATURE
ANB	ACID NEUTRALIZING BASIN	LAV	LAVATORY
AP	ACCESS PANEL	LWT	LEAVING WATER TEMPERATURE
ARCH	ARCHITECT	MBH	BTU PER HOUR (THOUSANDS)
			·
AS	AIR SEPARATOR	MCF	THOUSAND CUBIC FEET
BD	BUTTERFLY DAMPER	MH	MANHOLE
B/G	BELOW GRADE	NC	NOISE CRITERIA OR NORMALLY CLOSI
BTU	BRITISH THERMAL UNIT	NEG	NEGATIVE
BWV	BACKWATER VALVE	NIC	NOT IN CONTRACT
CCF	HUNDRED CUBIC FEET	NO	NORMALLY OPEN
CFH	CUBIC FEET PER HOUR	NTS	NOT TO SCALE
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
CL	CENTER LINE	OBD	OPPOSED BLADE DAMPER
CLG	CEILING	ORD	OVERFLOW ROOF DRAIN
CO	CLEAN OUT	PD	PRESSURE DROP OR DIFFERENCE
CONTR	CONTRACTOR	PE	PNEUMATIC-ELECTRIC
CONV	CONVECTOR	PLBG	PLUMBING
CUH	CABINET UNIT HEATER	1.25	PRESSURE REDUCING VALVE OR
CW	COLD WATER	PRV	PRESSURE REDUCING VALVE OR POWER ROOF VENTILATOR
		PSIA	
DB	DECIBEL		POUNDS/SQ INCH ABSOLUTE
DF	DRINKING FOUNTAIN	PSIG	POUNDS/SQ INCH GAUGE
DIA	DIAMETER	PVC	POLY VINYL CHLORIDE
DIFF	DIFFUSER	RA	RETURN AIR
DISCH	DISCHARGE	RCP	REINFORCED CONCRETE PIPE
DMPR	DAMPER	RD	ROOF DRAIN
DN	DOWN	RECIRC	RECIRCULATING
DR	DRAIN	REG	REGISTER
DS	DOWNSPOUT	RET	RETURN
DWG	DRAWING	RH	RELATIVE HUMIDITY
EAT	ENTERING AIR TEMPERATURE	RHT	REHEAT
EDR	EQUIVALENT DIRECT RADIATION	RHC	REHEAT COIL
EP	ELECTRIC-PNEUMATIC	RHW	RECIRCULATED HOT WATER
EWC	ELECTRIC WATER COOLER	RM	ROOM
EWT	ENTERING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
EXH	EXHAUST	RPZ	REDUCED ZONE BACKFLOW PREVENTI
EXP	EXPANSION	SA	SUPPLY AIR
F	FAHRENHEIT	SAN	SANITARY
FC			
	FAN COIL	SCFM	CFM, STANDARD CONDITIONS
FC0	FLOOR CLEAN OUT	SD	SMOKE DAMPER
FD	FIRE DAMPER OR FLOOR DRAIN	SP	STATIC PRESSURE
FHC	FIRE HOSE CABINET	SPECS	SPECIFICATIONS
FHR	FIRE HOSE RACK	SUP	SUPPLY
FLR	FLOOR	SQ	SQUARE
FLEX	FLEXIBLE	STM	STEAM
FM	FIRE MAIN	TD	TEMPERATURE DIFFERENCE
FPM	FEET PER MINUTE	TEMP	TEMPERATURE
FPS	FEET PER SECOND	TONS	TONS OF REFRIGERATION
FT	FEET OR FOOT	T-STAT	THERMOSTAT
F&T	FLOAT AND THERMOSTATIC	TYP	TYPICAL
FTG	FOOTING	UB	UP-BLAST
FTR	FINNED TUBE RADIATION	UG	UNDERGROUND
FV	FACE VELOCITY	UH	UNIT HEATER
GA	GAUGE	UR	URINAL
GAL	GALLONS DEP HOUR	V	SANITARY VENT
GPH	GALLONS PER HOUR	VAV	VARIABLE AIR VOLUME
GPM	GALLONS PER MINUTE	VD	VOLUME DAMPER
GR	GRILLE	VEL	VELOCITY
НВ	HOSE BIBB	VFD	VARIABLE FREQUENCY DRIVE
HD	HEAD	VOL	VOLUME
HOA	HANDS-OFF-AUTOMATIC	W	SANITARY WASTE
HTG	HEATING	W/	WITH
HTR	HEATER	W/O	WITHOUT
	HEATING, VENTILATING	WC	WATER CLOSET
HVAC	AND AIR CONDITIONING	WCO	WALL CLEAN OUT
		WH	WALL HYDRANT
HAU	HILLE AND		WOLL HILL/IVAINI
HYD HW	HYDRANT HOT WATER	WTR	WATER

	MECHANICAL SYMBOLS LEGEND	
PLUMBING	PLUMBING/PIPING	DUCTWORK
- AV - ACID VENT - BELOW GRADE	ELBOW DOWN	SUPPLY AIR
AV ACID VENT — ABOVE GRADE		RETURN AIR
- ACID WASTE - BELOW GRADE	PIPE CAP	EXHAUST AIR
	ELBOW UP	STANDARD BRANCH, NO SPLITTER -
	TEE, OUTLET UP	SUPPLY FLOW TO RIGHT — RETURN/EXHAUST FLOW TO LEFT
DOMESTIC COLD WATER	TEE, OUTLET DOWN	
DOMESTIC HOT WATER	CONNECTION DOTTON	BELLMOUTH WITH BALANCING DAMPER
	CONNECTION, BOTTOM	TURNING VANES
DOMESTIC RECIRCULATING HOT WATER	CONNECTION, TOP	TORNING VAINES
	CONNECTION, TOP	FLEXIBLE CONNECTION
OSD OVERFLOW STORM DRAIN — BELOW GRADE	ECCENTRIC REDUCER	FLEXIBLE CONNECTION
	─────── CONCENTRIC REDUCER	MANUAL VOLUME DAMPER
RO REVERSE OSMOSIS WATER	SHUTOFF VALVE	I TO THE TOTAL TOTAL STATE OF THE PARTY OF T
V SANITARY VENT - BELOW GRADE	BALL VALVE	RETURN OR EXHAUST GRILLE
	FLOW DIRECTION	OR REGISTER
SANITARY WASTE — BELOW GRADE	ELBOW	SUPPLY DUCT UP, POSITIVE PRESSURE
	<b>'</b>	
— SDT — SOIL DRAINAGE TILE	TEE TEE	RETURN DUCT UP, NEGATIVE PRESSURE
SOFT ——— SOFTENED COLD WATER (SCW)		
SHW—SOFTENED HOT WATER	FLOOR DRAIN	EXHAUST DUCT UP, NEGATIVE PRESSURE
TW TEMPERED WATER	WH + WALL HYDRANT	
STORM DRAIN — BELOW GRADE	FLOOR CLEANOUT	SUPPLY DUCT DOWN, POSITIVE PRESSURE
SD STORM DRAIN — ABOVE GRADE		
		RETURN DUCT DOWN, NEGATIVE PRESSURE
EXISTING PLUMBING TO REMOVED		<del>                                     </del>
EXISTINO 1 EGINIBINO 10 INELIGIOVED		EXHAUST DUCT DOWN, NEGATIVE PRESSURE
		SUPPLY DIFFUSER/REGISTER BLANKOFF INDICATED DARK
		RETURN GRILLE/REGISTER
		EXHAUST GRILLE/REGISTER
		CONCENTRIC DUCT TRANSITION
		ECCENTRIC DUCT TRANSITION



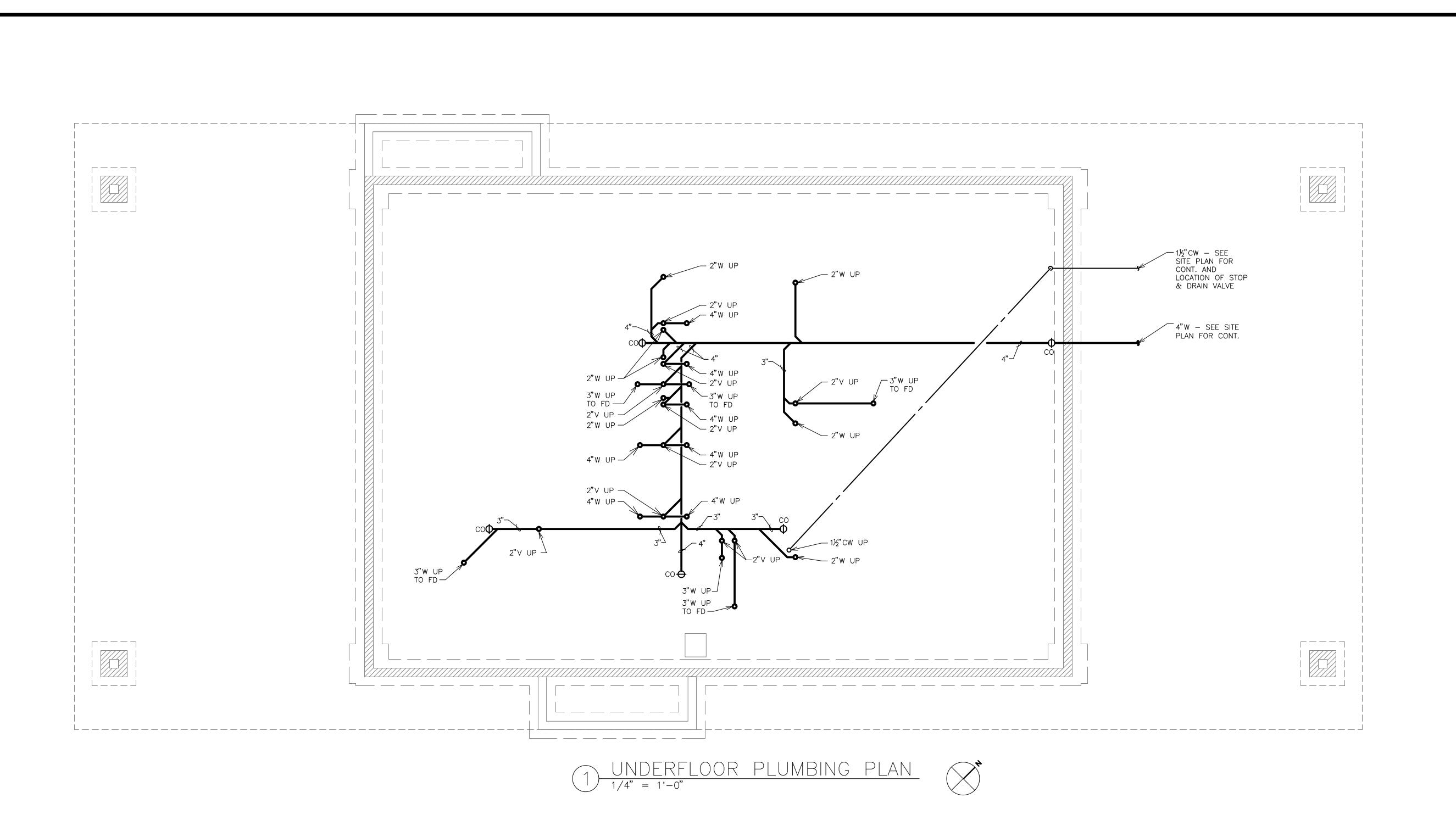


# SHEET INDEX

- MO.0 MECHANICAL COVER SHEET
  M1.0 UNDERFLOOR PLUMBING PLAN
  M2.0 PLUMBING PLAN
- M3.0 HVAC PLAN
- M4.0 PLUMBING RISERS AND SCHEDULES
- M5.0 MECHANICAL SPECIFICATIONS

SHEET NO. M0.0

SHEET 1 OF 6



RYFSA SPORTS COMPLEX

ROCHESTER COMMUNITY AI

ROCHESTER, MINNESOTA

UNDERFLOOR PLUMBING PI

SHEET 2 OF 6

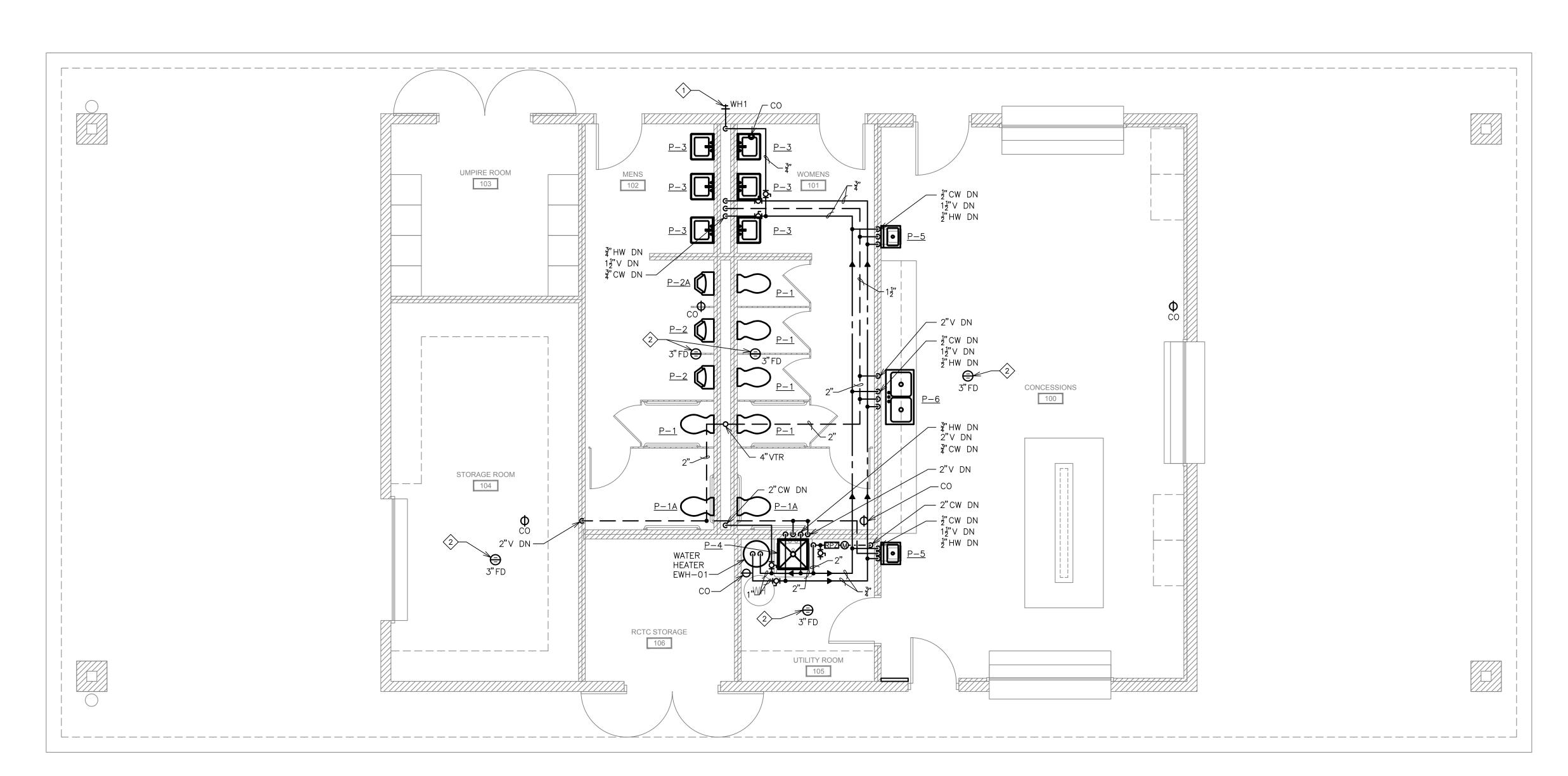
NEW WORK KEY NOTES:

PROVIDE WALL HYDRANT - SIM. TO WOODFORD MODEL 74.

PROVIDE FLOOR DRAIN - SIM. TO ZURN Z415B. PROVIDE DEEP SEAL P-TRAP.

SHEET NO.

SHEET 3 OF 6



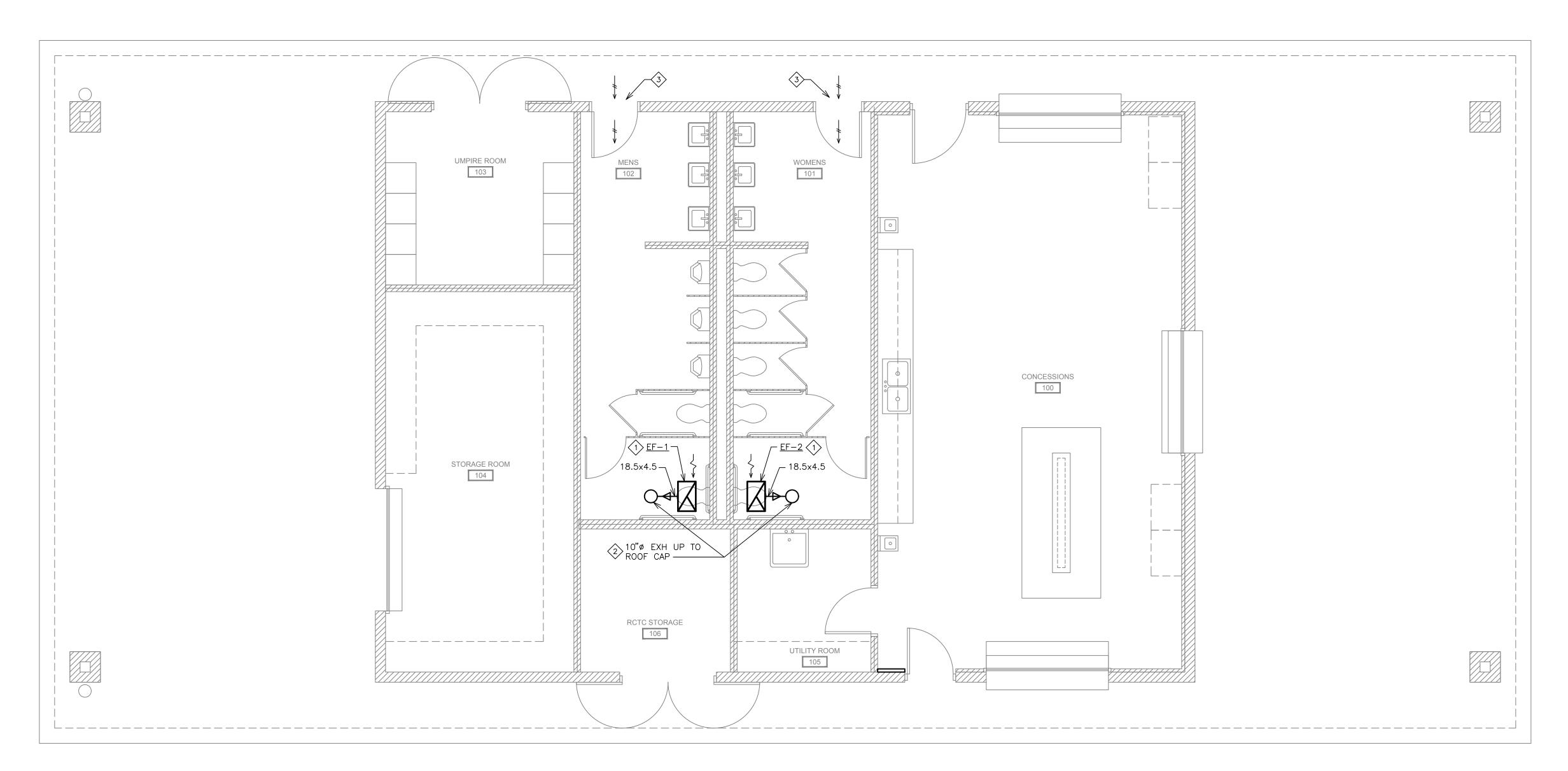
PROVIDE EXHAUST FAN — SIM. TO BROAN MODEL L500K, CEILING MOUNT, 473 CFM @ .125 SP, 705 RPM, 4.0 SONES, 120V—1PH, 2.2 AMPS, 232 WATTS. 3 DOOR TRANSFER GRILLES PROVIDED BY G.C.

NEW WORK KEY NOTES:

2 PROVIDE BROAN MODEL 437 ROOF CAP.

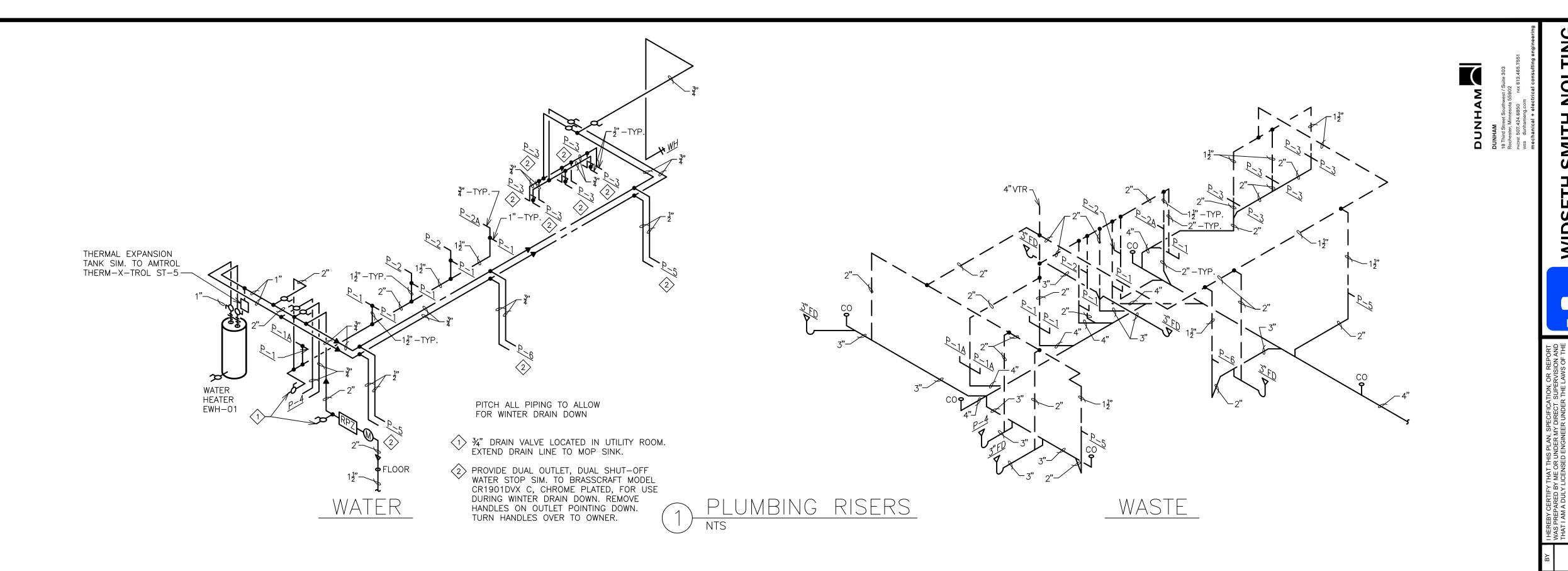
M3.0

SHEET 4 OF 6









# PLUMBING FIXTURE SCHEDULE

FIXTURE TAG	FIXTURE DESCRIPTION	MOUNTING	ADA	FIXTURE	TRIM	STOP		ASTE IN)	TRAP (IN)	VENT (IN)	CW HW (IN)	MECHANICAL NOTES
<u>P-1</u>	WATER CLOSET	FLOOR	NO	AMERICAN STANDARD MADERA FLOWISE 2234.001, 15" HIGH, ELONGATED BOWL, FLOOR MOUNT, TOP SPUD, WHITE.	SLOAN FLUSHOMETER MODEL ROYAL 111-1.28, 1.28 GPF LOW CONSUMPTION, ANGLE STOP, 1" IPS, TOP SPUD, NON-HOLD OPEN HANDLE, POLISHED CHROME	INTEGRAL ANGLE STOP ON FLUSH VALVE	INTEGRAL	4"	NA	2"	1 <mark>1</mark> " NA	PROVIDE OPEN FRONT WHITE SEAT EQUAL TO OLSONITE 95SSCT. FLUSH VALVE HANDLE TO BE ON THE APPROACH SIDE OF THE WATER CLOSET.
<u>P-1A</u>	WATER CLOSET	FLOOR	YES	AMERICAN STANDARD MADERA FLOWISE 3043.001, 16.5" HIGH, ELONGATED BOWL, FLOOR MOUNT, TOP SPUD, WHITE.	SLOAN FLUSHOMETER MODEL ROYAL 111-1.28, 1.28 GPF LOW CONSUMPTION, ANGLE STOP, 1" IPS, TOP SPUD, NON-HOLD OPEN HANDLE, POLISHED CHROME	INTEGRAL ANGLE STOP ON FLUSH VALVE	INTEGRAL	4"	NA	2"	1 <mark>1</mark> " NA	PROVIDE OPEN FRONT WHITE SEAT EQUAL TO OLSONITE 95SSCT. FLUSH VALVE HANDLE TO BE ON THE APPROACH SIDE OF THE WATER CLOSET.
<u>P-2</u>	URINAL	WALL	NO	AMERICAN STANDARD WASHBROOK 6590.001EC, WALL MOUNT, FLUSHING RIM, TOP SPUD, WHITE.	SLOAN FLUSHOMETER MODEL ROYAL 186-0.5, 0.5 GPF LOW CONSUMPTION, ANGLE STOP, 3/4" IPS, TOP SPUD, NON-HOLD OPEN HANDLE, POLISHED CHROME	INTEGRAL ANGLE STOP ON FLUSH VALVE	INTEGRAL	2"	NA	1 <u>1</u> "	3" NA	
<u>P-2A</u>	URINAL	WALL	YES	AMERICAN STANDARD WASHBROOK 6590.001EC, WALL MOUNT, FLUSHING RIM, TOP SPUD, WHITE.	SLOAN FLUSHOMETER MODEL ROYAL 186-0.5, 0.5 GPF LOW CONSUMPTION, ANGLE STOP, 3/4" IPS, TOP SPUD, NON-HOLD OPEN HANDLE, POLISHED CHROME	INTEGRAL ANGLE STOP ON FLUSH VALVE	INTEGRAL	2"	NA	1 <u>1</u> "	3" NA	
<u>P-3</u>	LAVATORY	WALL	YES	AMERICAN STANDARD LUCERNE 0355.012, 18.25"x20.5", WALL HUNG, CONCEALED ARM SUPPORT, VITREOUS CHINA WHITE.	MOEN CHATEAU, L4601 SERIES, SINGLE LEVER HANDLE, LESS WASTE, 1.2 GPM, POLISHED CHROME	McGUIRE QUARTER TURN BRASS BALL VALVE POLISHED CHROME PLATED CAST BRASS ANGLE VALVE KITS, LOOSE KEY, FLEXIBLE RISERS, ESCUTCHEONS	McGUIRE 1-1/4"x1-1/4" CAST BRASS CHROME PLATED "P" TRAP; EXTEND TO WALL WITH ESCUTCHEON.	12"	117"	1 <u>1</u> "	1" 2"	PROVIDE MOLDED COVERING FOR WATER & WASTE PIPING EQUAL TO TRUEBRO "LAV GUARD 2". PROVIDE McGUIRE CAST BRASS CHROME PLATED TAILPIECE & OPEN GRID STRAINER.
<u>P-4</u>	MOP BASIN	FLOOR	YES	MUSTEE 63M MOP BASIN, 24"x24"x10" HIGH, MOLDED STONE	CHICAGO FAUCET 897-RCF, WALL MOUNTED, VACUUM BREAKER SPOUT WITH HOSE THREAD, PAIL HOOK & SUPPORT, LEVER HANDLES, QUATURN COMPRESSION CARTRIDGE, ROUGH CHROME FINISH	PROVIDE SHUTOFF & CHECK VALVES ON BRANCH PIPING	CONTRACTOR PROVIDED P-TRAP	3"	3"	2"	3" 3" 4 4	PROVIDE No. 63.401 VINYL BUMPER GUARDS ON EXPOSED SIDES, No. 65.700 HOSE & BRACKET, No. 65.600 MOP HANGER
<u>P-5</u>	HAND SINK	WALL	YES	ADVANCE TABCO 7-PS-60, 304 SS, 17.25"x15.25", WITH SPLASH MOUNTED GOOSENECK FAUCET	SPLASH MOUNTED GOOSENECK FAUCET WITH LEVER HANDLES AND BASKET STRAINER INCLUDED WITH FIXTURE	McGUIRE QUARTER TURN BRASS BALL VALVE POLISHED CHROME PLATED CAST BRASS ANGLE VALVE KITS, LOOSE KEY, FLEXIBLE RISERS, ESCUTCHEONS	McGUIRE 1-1/4"x1-1/4" CAST BRASS CHROME PLATED "P" TRAP; EXTEND TO WALL WITH ESCUTCHEON.	12"	1 <u>1</u> "	1 <u>1</u> "	1" 1" 2"	PROVIDE MOLDED COVERING FOR WATER & WASTE PIPING EQUAL TO TRUEBRO "LAV GUARD 2". PROVIDE McGUIRE CAST BRASS CHROME PLATED TAILPIECE.
<u>P-6</u>	DOUBLE BOWL SINK	COUNTER - DROP IN	NO	ELKAY DLR432212, 18 GAUGE, TYPE 304 STAINLESS STEEL, 43"x22" OVERALL, TWO 19"x16"x12" DEEP BOWLS, 3 HOLES, SOUND DEADENED.	MOEN CHATEAU, 7425 SERIES, SINGLE LEVER HANDLE, LESS SPRAY, 1.5 GPM, POLISHED CHROME	McGUIRE QUARTER TURN BRASS BALL VALVE POLISHED CHROME PLATED CAST BRASS ANGLE VALVE KITS, LOOSE KEY, FLEXIBLE RISERS, ESCUTCHEONS	McGUIRE 1-1/2"x1-1/2" CAST BRASS CHROME PLATED "P" TRAP; EXTEND TO WALL WITH ESCUTCHEON.	2"	1 <u>1</u> "	1 <u>1</u> "	<u>1</u> " <u>1</u> " <u>2</u>	PROVIDE McGUIRE CAST BRASS CHROME PLATED TAILPIECE & LK-35 DUO STRAINERS.

MECHANICAL NOTES:

ELECTR	ELECTRIC WATER HEATER SCHEDULE										
MECHANICAL											
FOLUDIAENT		CTOPAGE	WATER	TELADED ATLIDE	HEATING		MODEL				
EQUIPMENT TAG	APPLICATION	STORAGE CAPACITY (GAL)	RECOVERY RATE (GPH)	TEMPERATURE RISE (F)	CAPACITY (kW)	MANUFACTURER	MODEL NUMBER	MECHANICAL NOTES			
EWH 01	DOMESTIC	50	46	80	9	A.O. SMITH	DEN-52	_			
		•			·						

MECHANICAL NOTES:

EL	E.	C	ΓR	(	CA	L

				CONTRO	OLLER			DISC	CONNECT AT M	IOTOR					
EQUIPMENT	-			FURNISHED BY/		CTRL WIRE		FUSE SIZE		FURNISHED BY/		1	CIRCUIT		ELECTRICAL
TAG	HP/LOAD	VOLTAGE   PHASE	TYPE	INSTALLED BY	LOCATION	BY	AMPS/TYPE	(AMPS)	NEMA TYPE	INSTALLED BÝ	LOCATION	PANEL	NUMBER	CONDUIT/FEEDER SIZE	NOTES
EWH 01	X	240 1	THERMOSTAT	DIV 22	INTEGRAL	MANUFACTURER	NA	NA	NA	NA	NA	P1	6,8	₹"C, 2#8 & 1#10 GND	1,2

GENERAL ELECTRICAL NOTES:

A. WHEN THE CONTROLLER TYPE IS A VFD OR MAGNETIC STARTER, REFER TO THE VARIABLE FREQUENCY DRIVE CONTROLLER SCHEDULE OR THE MAGNETIC STARTER SCHEDULE FOR MORE INFORMATION.

CONTROLLER TYPES:

VFD — VARIABLE FREQUENCY MOTOR CONTROLLER

MMS — MANUAL MOTOR STARTER (WITH OVERLOADS)

CP — CONTROL PANEL

MAGS — MAGNETIC STARTER

MRS/MS — MOTOR RATED SWITCH (WITHOUT OVERLOADS)

VFD/MAGS — VFD WITH BYPASS OPTION AND EXTERNAL STARTER

ELECTRICAL NOTES:

1. NO DISCONNECT NEEDED, EQUIPMENT WITHIN SITE OF ELECTRICAL PANEL.

2. VERIFY VOLTAGE PENDING ACCEPTANCE OF ELECTRICAL SERVICE ALTERNATE.

SHEET NO.

SHEET 5 OF 6

1.1 GENERAL CONDITION A.THE GENERAL. SPECIAL. AND OTHER CONDITIONS OF THE ARCHITECTURAL MECHANICAL AND VENDOR DOCUMENTS SHALL BE CONSIDERED AN INTEGRAL

PART OF THESE MECHANICAL SPECIFICATIONS B.REFERENCE TO "CONTRACTOR" IN THIS SPECIFICATION SHALL MEAN "MECHANICAL CONTRACTOR (MC)", UNLESS OTHERWISE NOTED. WORK SPECIFIED HEREIN IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE

A.FURNISH LABOR. MATERIALS. EQUIPMENT. TOOLS. AND OTHER ITEMS NECESSARY FOR, OR INCIDENTAL TO, INSTALLATION OF A COMPLETE MECHANICAL SYSTEM AS REQUIRED FOR THIS PROJECT. B. ALSO INCLUDE OTHER WORK AND MISCELLANEOUS EQUIPMENT NOT

SPECIFICALLY MENTIONED, BUT REASONABLY INFERRED, THAT ARE REQUIRED FOR A FULLY FUNCTIONAL AND TESTED SYSTEM.

#### .3 DRAWINGS AND DOCUMENTS

A. THE DRAWINGS AND SPECIFICATIONS FORM A COMPLETE SET OF PLANS FOR THE MECHANICAL WORK FOR THIS PROJECT. WHAT IS REQUIRED BY EITHER SHALL BE AS BINDING AS IF REQUIRED BY BOTH. IN THE EVENT THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT, THE GREATER REQUIREMENT OR COST SHALL BE INCLUDED IN BID, OR IF TIME, A CLARIFICATION WILL BE

B. BIDDERS SHALL EXAMINE OTHER TRADE AND EQUIPMENT VENDOR DRAWINGS AND SPECIFICATIONS TO AVOID OMISSIONS, DUPLICATIONS, AND TO INSURE COMPLETE INSTALLATION OF MECHANICAL WORK.

C.THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW APPROXIMATE LOCATION ONLY. PLACEMENT OF MECHANICAL EQUIPMENT AND DEVICES SHALL NOT INTERFERE WITH LOCATIONS OR CLEARANCES OF OTHER TRADES' MATERIALS OR EQUIPMENT. COORDINATE THE PLACEMENT OF MECHANICAL DEVICES WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS.

D.THE DIRECT ROUTING OF DUCTWORK AND PIPING IS NOT ASSURED. EXACT REQUIREMENTS SHALL BE GOVERNED BY THE CONDITIONS OF THE PROJECT SITE. EXTRA LENGTHS OF DUCTWORK, PIPING AND ASSOCIATED ELBOWS, ETC., NECESSITATED BY SUCH CONDITIONS, SHALL BE INCLUDED IN THE BID.

#### 1.4 CODES, INSPECTIONS, AND FEES

A.THE COMPLETED MECHANICAL INSTALLATION SHALL COMPLY WITH THE LATEST EDITION OF ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, REGULATIONS, AND STANDARDS INCLUDING INTERPRETATIONS BY APPROPRIATE AUTHORITIES HAVING JURISDICTION. WHERE THE DRAWINGS AND SPECIFICATIONS CALL FOR WORKMANSHIP OR MATERIALS IN EXCESS OF CODE OR REGULATORY REQUIREMENTS, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN

B. THE WORK SPECIFIED HEREIN SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY STATE AND LOCAL AUTHORITIES HAVING JURISDICTION AND THE ENGINEER. THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS TO HAVE THE MECHANICAL WORK INSPECTED BY APPROPRIATE INSPECTOR(S) AND SHALL PROVIDE TWO (2) COPIES OF FINAL SIGNED "CERTIFICATE OF

INSPECTION" TO THE OWNER C.OBTAIN AND PAY FOR LICENSES, PERMITS, FEES AND CHARGES FOR WORK INSTALLED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE TO PAY FEES AND CHARGES LEVIED BY THE UTILITY COMPANY FOR CONNECTION TO MECHANICAL SERVICES.

A. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR MECHANICAL JOB SITE SAFETY. INCLUDING SAFETY OF PEOPLE AND PROPERTY DURING PERFORMANCE OF WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

B NO ACT DRAWING REVIEW OR CONSTRUCTION REVIEW BY THE OWNER. THE ENGINEERS OR THEIR CONSULTANTS, IS INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE

## 1.6 CONDITIONS AT THE SITE

A.EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING BUILDING CONDITIONS AND LIMITATIONS PRIOR TO SUBMITTING BID. NO EXTRA PAYMENT WILL BE ALLOWED FOR WORK REQUIRED BECAUSE OF THESE CONDITIONS, OR IF INFORMATION IS VISIBLE OR READILY ATTAINABLE, FOR ANY LIMITATION OR MISUNDERSTANDING OF EXISTING CONDITIONS

B. ANY DISCREPANCIES FROM THESE DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT/ENGINEER PRIOR TO BID.

# 1.7 WORKMANSHIP AND CONTRACTOR QUALIFICATIONS

A.INSTALL MECHANICAL EQUIPMENT AND MATERIALS IN A NEAT AND WORKMANLIKE MANNER BY PERSONS EXPERIENCED AND SKILLED IN THE TRADE. HAPHAZARD OR POOR INSTALLATION WILL BE CAUSE FOR REJECTION OF WORK. EXPOSED COMPONENTS OF THE MECHANICAL SYSTEMS SHALL BE SQUARE AND TRUE WITH BUILDING LINES AND SURFACES

B. CONTRACTOR SHALL BE LICENSED IN THE STATE AND CITY IN WHICH THE PROJECT IS LOCATED.

## 1.8 COORDINATION OF WORK

A. GIVE CAREFUL CONSIDERATION TO THE WORK OF THE GENERAL, MECHANICAL AND OTHER CONTRACTORS/SUBCONTRACTORS ON THE PROJECT. ORGANIZE AND PHASE THE MECHANICAL WORK SO THAT IT WILL NOT INTERFERE WITH THE WORK OF OTHER TRADES

B. DRAWINGS AND SPECIFICATIONS FOR OTHER TRADES AND GENERAL CONSTRUCTION DRAWINGS SHALL BE CONSULTED FOR COORDINATION INFORMATION, DETAILS, DIMENSIONS, ETC. COORDINATE SHAFTS, CHASES, FURRED SPACES, SUSPENDED CEILING, LOCATIONS OF EQUIPMENT, ETC. C.THE LOCATION OF EQUIPMENT ROUGH-INS SHALL BE VERIFIED WITH THE

ACTUAL EQUIPMENT OR APPROVED SHOP DRAWINGS PRIOR TO ANY ROUGH IN WORK. NOTIFY ENGINEER OF ANY DISCREPANCIES. D.DIMENSIONS GIVEN ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER

SCALED DIMENSIONS. DIMENSIONS, WHETHER CALCULATED OR SCALED, SHALL BE VERIFIED IN THE FIELD.

E. CHECK ACTUAL JOB CONDITIONS BEFORE FABRICATING WORK. COORDINATE WITH OTHER TRADES TO AVOID REWORK DUE TO FIELD CONDITIONS. CHANGES OR ADDITIONS, SUBJECT TO ADDITIONAL COMPENSATION, WHICH ARE MADE WITHOUT WRITTEN AUTHORIZATION AND AN AGREED PRICE, SHALL BE AT THE CONTRACTOR'S RISK AND EXPENSE.

E COORDINATE ROLLTING OF PIPING AND DUCTWORK CONCEALED IN WALLS SOFFITS OR CEILINGS INSTALLED BY THE GENERAL CONTRACTOR. FIELD COORDINATE WORK TO CONCEAL ALL PIPING AND DUCTWORK

G.VERIFY ITEMS SUCH AS DOOR SWINGS, WINDOW LOCATIONS, CASEWORK, ETC., BEFORE INSTALLING ANY MECHANICAL EQUIPMENT OR DEVICES.

H. MAKE MINOR ADJUSTMENTS TO WORK WHERE REQUESTED BY THE OWNER OR

THE OWNER'S REPRESENTATIVE WHEN ADJUSTMENTS ARE NECESSARY FOR PROPER OPERATION AND WITHIN THE INTENT OF THE CONTRACT.

#### .9 MATERIALS AND EQUIPMENT A.UNLESS OTHERWISE SPECIFIED, MATERIAL AND EQUIPMENT SHALL BE NEW AND MANUFACTURED BY APPROVED OR LISTED MANUFACTURERS. MATERIALS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF GOVERNING CODES.

B. ALL MATERIAL AND EQUIPMENT SHALL BE LISTED AND LABELED BY UNDERWRITERS LABORATORIES, INC. (UL), AS CONFORMING TO ITS STANDARDS IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THAT TYPE OF MATERIAL OR EQUIPMENT.

C.OBTAIN WRITTEN APPROVAL 7 DAYS PRIOR TO BID, TO USE ANY PROPOSED SUBSTITUTE MATERIAL OR EQUIPMENT BEFORE CONTRACTING TO PURCHASE SUCH SUBSTITUTES. THE OWNER RESERVES THE RIGHT TO REQUIRE THE REMOVAL OF ANY MATERIAL OR EQUIPMENT WHICH DOES NOT HAVE THIS PART 2 - PRODUCTS WRITTEN APPROVAL AND WHICH DOES NOT COMPLY WITH THE SPECIFICATIONS, REGARDLESS OF THE STATE OF INSTALLATION OF SUCH EQUIPMENT

D. WHERE EQUIPMENT SUPPLIED BY THE CONTRACTOR HAS CHARACTERISTICS OTHER THAN AS SPECIFIED HEREIN, THE CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, REMOVE AND REPLACE THE MECHANICAL WORK NECESSITATED BY THE SUBSTITUTED PRODUCT.

# .10 TEMPORARY INSTALLATIONS

A.COMPLY WITH THE OWNER AND GENERAL CONTRACTOR REQUIREMENTS. MECHANICAL WORK TO BE IN CONFORMANCE WITH ALL APPLICABLE CODE REQUIREMENTS.

B.INTERRUPTION OF OWNER'S OPERATION: OBTAIN PERMISSION FROM OWNER BEFORE DISRUPTION OF EXISTING FACILITY. SCHEDULE WORK DURING OWNER APPROVED TIME PERIOD USING ADEQUATE SIZED CREW AND OVERTIME COMPENSATION AS REQUIRED.

C.AFTER SERVICE HAS BEEN RESTORED FOLLOWING AN INTERRUPTION, EACH TRADE SHALL INSPECT ALL AREAS AFFECTED BY THE INTERRUPTIONS AND BE RESPONSIBLE FOR RETURNING ALL SERVICES TO THE SAME OPERATING CONDITION WHICH EXISTED PRIOR TO THE INTERRUPTION.

D.REMOVE THE TEMPORARY INSTALLATION OF MECHANICAL EQUIPMENT DUCTWORK OR PIPING AT THE END OF THE PROJECT. PATCH AND SEAL

#### 1.11 PROTECTION OF EQUIPMENT AND MATERIAL

A. STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIAL DELIVERED TO THE JOB SITE. COVER WITH WATERPROOF, TEAR RESISTANT, HEAVY DUTY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM CONSTRUCTION DEBRIS, WATER, DUST, ETC.

B. PLUG OR CAP OPEN ENDS OF PIPES AND DUCTS WHILE STORED OR INSTALLED DURING CONSTRUCTION TO PREVENT ENTRANCE OF DEBRIS INTO THE

## 1.12 CUTTING AND PATCHING

A.PERFORM CORE DRILLING, CUTTING AND PATCHING NECESSARY FOR THE COMPLETION OF THE MECHANICAL WORK FOR THIS PROJECT. NO STRUCTURAL MEMBERS SHALL BE DISTURBED WITHOUT OBTAINING WRITTEN 2.5 PLUMBING VALVE COMMON REQUIREMENTS PERMISSION OF THE ENGINEER

B. SURFACES WHICH ARE DISTURBED IN ANY WAY BY THE CONTRACTOR SHALI BE REPAIRED AND REFINISHED TO PROVIDE A SURFACE EQUAL IN STRENGTH, DURABILITY, AND APPEARANCE TO THE ORIGINAL SURFACE.

C.PENETRATIONS THROUGH SMOKE. FIRE. HAZARDOUS AREA. OR OTHER RATED SEPARATIONS SHALL BE FIRE SEALED TO PRESERVE THE RATINGS OF THE SEPARATIONS. PROVIDE THRU-PENETRATION FIRESTOP SYSTEMS MEETING ASTM E 814 OR UL 1479. D. ALL CUTTING, DRILLING, PATCHING, REPAIRING, AND REFINISHING SHALL BE

DONE BY PERSONS SKILLED IN APPROPRIATE TRADES. E.CLEAN AWAY RUBBISH AND LITTER GENERATED DURING MECHANICAL

#### 1.13 SHOP DRAWINGS AND SUBMITTALS

A. SUBMIT SHOP DRAWINGS FOR NEW MECHANICAL EQUIPMENT IN PDF FORMAT SUBMIT ADDITIONAL HARD COPIES AS REQUIRED BY THE GENERAL CONTRACT SHOP DRAWING SUBMITTALS SHALL ALLOW FOR A MINIMUM OF 7 WORKING DAYS FOR ENGINEER REVIEW

B. SHOP DRAWINGS SHALL BE DETAILED, DIMENSIONED MANUFACTURERS' DRAWINGS. EACH SET OF DOCUMENTS SHALL LIST THE PROJECT NAME AND ADDRESS, AND CONTRACTOR'S NAME, ADDRESS, AND TELEPHONE NUMBER. AN INDEX PAGE SHALL LIST INDIVIDUALLY THE ITEMS IN THE SUBMITTAL WITH REFERENCES TO TYPE DESIGNATIONS OR OTHER IDENTIFIERS NOTED ON

C.SUBMITTAL TO THE ENGINEER SHALL BE VIA THE GENERAL CONTRACTOR AND, WHERE REQUIRED. THE ARCHITECT. DO NOT SUBMIT INCOMPLETE SHOP DRAWINGS. SHOP DRAWINGS THAT ARE INCOMPLETE OR NOT SIGNED BY BOTH THE CONTRACTOR AND THE GENERAL CONTRACTOR SHALL BE RETURNED WITHOUT REVIEW.

D.CROSS OUT ANY INFORMATION OR OPTIONS NOT BEING PROVIDED OR DOES NOT APPLY TO THE PROJECT. FAILURE TO DO SO ASSUMES THAT EQUIPMENT, OPTIONS AND ACCESSORIES SHOWN IN THE SHOP DRAWING SUBMITTAL ARE

E.IF THE CONTRACTOR USES MATERIALS OTHER THAN THOSE SPECIFIED THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT, AT NO ADDITIONAL

COST TO THE OWNER. F. THE APPROVAL STAMP ON THE SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OR THE SUPPLIER OF RESPONSIBILITY FOR FULL CONTRACT

## .14 MAINTENANCE MANUAL AND RECORD DRAWINGS

(2) DIGITAL DATA DVD'S OF A MANUAL COVERING THE OPERATION AND MAINTENANCE OF EQUIPMENT PROVIDED UNDER THIS CONTRACT. SUBMIT ADDITIONAL COPIES AS REQUIRED BY THE GENERAL CONTRACT. THE MANUALS SHALL BE IN A 3-RING, LOOSE LEAF, HEAVY DUTY BINDER AND SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL. EACH MANUAL SHALL CONTAIN 2.3 VALVES 1. COMPLETE MANUFACTURER CATALOG DATA, MANUFACTURER'S

A.FURNISH THE OWNER WITH A MINIMUM OF TWO (2) PRINTED COPIES AND TWO

LITERATURE. WIRING DIAGRAMS. CONTROL DIAGRAMS. SEQUENCE OF OPERATIONS. PIPED SYSTEM DIAGRAMS. DETAILED OPERATING INSTRUCTIONS, AND A COMPLETE LISTING OF SUPPLIERS AND DISTRIBUTORS WHERE REPLACEMENT PARTS AND MAINTENANCE SERVICES ARE AVAILABLE FOR INSTALLED EQUIPMENT. INCLUDE ALL MECHANICAL SHOP DRAWINGS.

2. PHYSICAL DESCRIPTION AND INSTALLATION INSTRUCTIONS, USER'S MANUAL AND OPERATING INSTRUCTIONS.

REPLACEABLE PARTS LIST

INSPECTION CERTIFICATES, SIGNED BY THE APPROPRIATE INSPECTOR. 5 FULL LISTING OF PRODUCT WARRANTIES AND EXTENDED WARRANTIES

WITH REGISTRATION AND CONTACT INFORMATION. DATA DVD WITH INDEXED PDF DOCUMENTS OF ALL ITEMS IN THE MANUAL B.MARKUP A SET OF CONSTRUCTION DOCUMENTS AS WORK PROGRESSES. SHOW ACTUAL ROUTING WITH DIMENSIONED INFORMATION, LOCATIONS OF CONCEALED PIPES, VALVES OR DUCTS, SIZES, TYPES, EQUIPMENT LOCATION CHANGES, AND ANY OTHER CHANGES OR DEVIATIONS BETWEEN PROJECT WORK, AS BUILT, AND THE CONTRACT DOCUMENTS, MARKINGS SHALL BE NEAT, LEGIBLE, AND PERMANENT, TRANSFER APPLICABLE MARKINGS TO A SECOND SET OF DOCUMENTS AND PROVIDE BOTH SETS OF RECORD DOCUMENTS TO THE OWNER.

A.UPON COMPLETION OF THE WORK AND AT OTHER TIMES DIRECTED, REMOVE MATERIALS AND SCRAP GENERATED BY THE MECHANICAL INSTALLATION AND LEAVE THE PREMISES IN A CLEAN AND ORDERLY CONDITION.

B. CLEAN MECHANICAL EQUIPMENT INTERIORS PRIOR TO ENERGIZING AND BEFORE FINAL ACCEPTANCE. CLEAN PLUMBING FIXTURES AND AIR DISTRIBUTION DEVICES. REPAIR, CLEAN AND TOUCH UP MINOR SCRATCHES OR BLEMISHES ON FACTORY PAINTED EQUIPMENT.

C.DAMAGED, DENTED OR REFURBISHED EQUIPMENT SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

# 1.16 ACCEPTANCE DEMONSTRATION AND TRAINING

A.PERFORM SYSTEM START-UP. TESTING AND PROGRAMMING PRIOR TO OWNER'S TRAINING. DO NOT SCHEDULE DEMONSTRATIONS UNTIL SYSTEMS ARE FULLY OPERATIONAL AND READY TO TURN OVER TO THE OWNER.

B. DEMONSTRATE TO THE OWNER THE OPERATION OF THE MECHANICAL INSTALLATIONS. THE TIMING OF THE DEMONSTRATION WILL BE DETERMINED BY THE OWNER UPON COMPLETION OF THE WORK.

A.FURNISH THE OWNER THE FOLLOWING SPARE PARTS FOR THE EQUIPMENT FURNISHED FOR THIS PROJECT: 1. WATER CLOSET AND URINAL FLUSHOMETER REPAIR KIT, ONE PER TEN

# FLUSH VALVE, MINIMUM OF TWO.

1.18 GUARANTEES AND WARRANTIES A.FURNISH THE OWNER WITH A WRITTEN GUARANTEE OF PARTS AND LABOR FOR THE PERIOD OF ONE (1) YEAR AGAINST THE FAILURE OF ANY PART OF THE MECHANICAL SYSTEMS INSTALLED DUE TO FAULTY MATERIAL OR WORKMANSHIP, WITHOUT ANY CHARGES, TO THE OWNER. GUARANTEE PERIOD TO START UPON SUBSTANTIAL COMPLETION OR AS SPECIFIED UNDER GENERAL AND SPECIAL CONDITIONS.

B. EXTENDED WARRANTIES OR PRODUCT WARRANTIES EXCEEDING ONE (1) YEAR TO BE PASSED ON TO THE OWNER.

A. SLEEVES IN BEARING AND MASONRY WALLS, FLOORS AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. ALL OTHER SLEEVES SHALL BE A MINIMUM 22 GAUGE GALVANIZED STEEL

# 2.2 HANGERS AND SUPPORTS

A.STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO

B. PROVIDE HANGERS AND SUPPORTS AS REQUIRED FOR ALL HUNG PIPING AND

C.HANGERS TO INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON,

BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC. NECESSARY FOR INSTALLATION

D. DESIGN SUPPORTS FOR MULTIPLE PIPES AND EQUIPMENT.

E.PROVIDE COPPER CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN DIRECT CONTACT WITH COPPER PIPING

G.DUCT ATTACHMENTS TO BE SHEET METAL SCREWS, BLIND RIVETS OR

F. HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DIAMETER OF INSULATION. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN PIPE INSULATION AND HANGER.

2.3 EXCAVATION AND BACKFILLING A.EXCAVATION SHALL BE CLASSIFIED AS COMMON EXCAVATION INCLUDING

SELF-TAPPING METAL SCREWS.

#### REMOVAL AND DISPOSITION OF WHATEVER MATERIAL OR SUBSTANCES ARE ENCOUNTERED FOR THE PIPES AND GRADES INDICATED ON THE PLANS. SURPLUS MATERIALS ARE TO BE DISPOSED OF BY THE CONTRACTOR.

2.4 PIPING COMMON REQUIREMENTS A. SEE INDIVIDUAL PLUMBING SECTION FOR SPECIFIC PIPE REQUIREMENTS.

A. SEE INDIVIDUAL PLUMBING SECTION FOR SPECIFIC VALVE REQUIREMENTS

A. ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAN 50 PER NFPA. B. MINERAL FIBER PREFORMED PIPE: MINERAL OR GLASS FIBERS BONDED WITH THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE I, GRADE A, 850 DEGREE F WITH FACTORY APPLIED ASJ. FACTORY APPLIED JACKET IS WHITE KRAFT PAPER, FIBERGLASS REINFORCED SCRIM WITH ALUMINUM FOIL

C.FLEXIBLE ELASTOMERIC PIPE: CLOSED CELL, SPONGE OR EXPANDED RUBBER FLEXIBLE ELASTOMERIC. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIAL AND TYPE II FOR SHEET MATERIAL.

BACKING; COMPLYING WITH ASTM C 1126, TYPE II.

D. ASJ TAPES: WHITE VAPOR RETARDER TYPE MATCHING FACTORY APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136, 3" WIDTH E. PROTECTIVE SHIELDING PIPE COVERS: TRUEBRO MODEL 102W WHITE "HANDI

LAV GUARD" OR EQUAL FOR COVERING PLUMBING FIXTURES HOT AND COLD

WATER AND WASTE TRAP PIPING PER ADA REQUIREMENTS. F. FITTING AND ELBOW COVERS: ONE PIECE PRE-MOLDED PVC COVERS G.FIELD-APPLIED JACKETS SHALL COMPLY WITH ASTM C 921, TYPE I, UNLESS

A.NEW PIPING IN FINISHED SPACES: ONE PIECE CAST BRASS TYPE WITH POLISHED CHROME FINISH

A.POTABLE WATER MATERIALS SHALL COMPLY WITH NSF 61 AND ANSI 372 FOR

LEAD FREE CONSTRUCTION. 2.2 PIPING A. HARD COPPER TUBE: ASTM B 88, TYPE L WATER TUBE, DRAWN TEMPER.

B. SOFT COPPER TUBE: ASTM B 88, TYPE K WATER TUBE, ANNEALED TEMPER. C.CAST COPPER SOLDER JOINT FITTINGS: ASME B16.18, PRESSURE FITTINGS. D. WROUGHT COPPER SOLDER JOINT FITTINGS: ASME B16.22, WROUGHT COPPER

E. PVC PIPE: SOLID WALL, ASTM D 2665, SCHEDULE 40 DRAIN, WASTE AND VENT. F. PVC SOCKET FITTINGS: ASTM D 2665, MADE TO ASTM D 3311 DRAIN, WASTE AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE.

G.PVC ADHESIVE PRIMER: ASTM F 656 H. PVC SOLVENT CEMENT: ASTM D 2564.

A. MINIMUM PRESSURE RATING IS 175 PSIG B. PROVIDE HANDLE EXTENSIONS ON ALL INSULATED PIPING.

C.BRONZE BALL VALVES: 1. STANDARD: MSS SP 110.

2. SWP RATING: 150 PSIG. CWP RATING: 600 PSIG.

4. BODY DESIGN: TWO PIECE FULL PORT BODY: BRONZE.

SEATS: PTFE OR TFE.

STEM: BRONZE. 8. BALL: CHROME PLATED.

# 9. PORT: FULL.

A.BACKFLOW PREVENTERS: 1 REDUCED PRESSURE PRINCIPLE: ASSE 1013 CONTINUOUS PRESSURE APPLICATION, 12 PSIG MAXIMUM PRESSURE LOSS, BRONZE BODY 2" AND LESS, DUCTILE IRON BODY WITH APPROVED INTERIOR LINING OVER 2", THREADED OR FLANGED CONNECTIONS, STRAIGHT THROUGH HORIZONTAL CONFIGURATION WITH INLET AND OUTLET ISOLATION VALVES AND AIR GAP FITTING.

# 2.5 CLEANOUTS AND FLOOR DRAINS

A.METAL FLOOR CLEANOUTS:

1. STANDARD: ASME A112.36.2M FOR COATED ADJUSTABLE HOUSING CLEANOUT. 2. SIZE: SAME SIZE AS CONNECTED DRAINAGE PIPING.

3. TYPE: THREADED, CAST IRON ADJUSTABLE HOUSING. 4. BODY OR FERRULE: CAST IRON.

5. OUTLET CONNECTION: NO HUB. 6. CLOSURE: BRASS PLUG WITH STRAIGHT THREADS AND GASKET

7. FRAME AND COVER MATERIAL AND FINISH: ROUND NICKEL BRONZE, COPPER ALLOY.

TOP LOADING CLASSIFICATION: MEDIUM DUTY. 9. RISER: ASTM A 74, SERVICE CLASS, CAST IRON DRAINAGE PIPE FITTING

B. CAST IRON WALL CLEANOUTS:

STANDARD: ASME A112.36.2M. INCLUDE WALL ACCESS.

2. SIZE: SAME SIZE AS CONNECTED DRAINAGE PIPING. 3. BODY: HUB AND SPIGOT, CAST IRON SOIL PIPE T BRANCH OR HUBLESS

CAST IRON SOIL PIPE TEST TEE 4. CLOSURE: COUNTERSUNK, DRILLED AND THREADED BRASS PLUG. 5. WALL ACCESS: ROUND, FLAT, CHROME PLATED BRASS OR STAINLESS

STEEL COVER PLATE WITH SCREW. C.FLOOR DRAINS: SEE SCHEDULE ON DRAWINGS.

2.6 COMMERCIAL ELECTRIC WATER HEATER A.MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE

PRODUCTS BY ONE OF THE FOLLOWING:

 AMERICAN WATER HEATERS BRADFORD WHITE CORPORATION. RHEEM MANUFACTURING COMPANY.

4. SMITH, A. O. WATER PRODUCTS CO.; A DIVISION OF A. O. SMITH

CORPORATION STATE INDUSTRIES.

B. STANDARD: UL 1453. C.STORAGE-TANK CONSTRUCTION: ASME-CODE, STEEL VERTICAL

TANK AND PIPING CONNECTIONS. ATTACH TAPPINGS TO TANK BEFORE 2. NPS 2 AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1.

1. TAPPINGS: FACTORY FABRICATED OF MATERIALS COMPATIBLE WITH

3. PRESSURE RATING: 150 PSIG.

4. INTERIOR FINISH: COMPLY WITH NSF 61 BARRIER MATERIALS FOR

POTABLE-WATER TANK LININGS, INCLUDING EXTENDING LINING MATERIAL

INTO TAPPINGS D. FACTORY-INSTALLED STORAGE-TANK APPURTENANCES:

ANODE ROD: REPLACEABLE MAGNESIUM. 2. DRAIN VALVE: CORROSION-RESISTANT METAL COMPLYING WITH ASSE

4. JACKET: STEEL WITH ENAMELED FINISH.

INSULATION: COMPLY WITH ASHRAE/IESNA 90.1.

5. HEATING ELEMENTS: ELECTRIC, SCREW-IN OR BOLT-ON IMMERSION TEMPERATURE CONTROL: ADJUSTABLE THERMOSTAT.

7. SAFETY CONTROLS: HIGH-TEMPERATURE-LIMIT AND LOW-WATER CUTOFF

DEVICES OR SYSTEMS 8. RELIEF VALVES: ASME RATED AND STAMPED FOR COMBINATION TEMPERATURE-AND-PRESSURE RELIEF VALVES. INCLUDE ONE OR MORE RELIEF VALVES WITH TOTAL RELIEVING CAPACITY AT LEAST AS GREAT AS HEAT INPUT. AND INCLUDE PRESSURE SETTING LESS THAN DOMESTIC-WATER HEATER WORKING-PRESSURE RATING. SELECT ONE RELIEF VALVE WITH SENSING ELEMENT THAT EXTENDS INTO STORAGE

E. FIELD-INSTALLED ACCESSORIES

1. PIPING-TYPE HEAT TRAPS: FIELD-FABRICATED PIPING ARRANGEMENT ACCORDING TO ASHRAE/IESNA 90.1.

F. CAPACITY AND CHARACTERISTICS SEE SCHEDULE ON DRAWINGS.

2.7 DOMESTIC WATER COMPRESSION TANKS

A.MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

2. SMITH, A. O. WATER PRODUCTS CO.; A DIVISION OF A. O. SMITH CORPORATION. STATE INDUSTRIES.

4. TACO, INC. B. DESCRIPTION: STEEL PRESSURE-RATED TANK CONSTRUCTED WITH WELDED JOINTS AND FACTORY-INSTALLED BUTYL-RUBBER DIAPHRAGM. INCLUDE AIR PRECHARGE TO MINIMUM SYSTEM-OPERATING PRESSURE AT TANK.

1. TAPPINGS: FACTORY-FABRICATED STEEL, WELDED TO TANK BEFORE

TESTING AND LABELING. INCLUDE ASME B1.20.1 PIPE THREAD. 2. INTERIOR FINISH: COMPLY WITH NSF 61 BARRIER MATERIALS FOR POTABLE-WATER TANK LININGS, INCLUDING EXTENDING FINISH INTO AND THROUGH TANK FITTINGS AND OUTLETS.

AIR-CHARGING VALVE: FACTORY INSTALLED. D. CAPACITY AND CHARACTERISTICS:

 SEE SCHEDULE ON DRAWINGS 2.8 PLUMBING FIXTURES

A. SEE SCHEDULE ON DRAWINGS.

A.COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" STANDARD FOR MATERIALS. MATERIAL THICKNESS. DUCT CONSTRUCTION METHODS, STATIC PRESSURE CLASS, SEALING AND LEAKAGE CLASS REQUIREMENTS, DUCT SUPPORT INTERVALS AND FITTING

B. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M WITH G90 GALVANIZED COATING DESIGNATION. MILL PHOSPHATIZED FINISH ON EXPOSED C.SEALANTS AND GASKETS: SURFACE-BURNING CHARACTERISTICS FOR

SEALANTS AND GASKETS SHALL BE A MAXIMUM FLAME-SPREAD INDEX OF 25

AND A MAXIMUM SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING

A.MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE

TO UL 723; CERTIFIED BY AN NRTL.

PRODUCTS BY ONE OF THE FOLLOWING: BROAN. 2. GREENHECK FAN CORPORATION.

LOREN COOK COMPANY. PENNBARRY.

B. CEILING VENTILATING FANS: 1. GENERAL: CEILING MOUNT HIGH CAPACITY VENTILATION FAN WITHOUT 2. HOUSING: RUST PROOF GALVANIZED STEEL BODY WITH RECTANGULAR PLUMBING

DUCT CONNECTION, INTEGRAL BACKDRAFT DAMPER AND MULTI-POSITION CEILING MOUNTING BRACKETS. 3. MOTOR/BLOWER: REMOVABLE PERMANENTLY LUBRICATED PLUG-IN THERMALLY PROTECTED MOTOR WITH RESILIENT ANTI-VIBRATION MOUNTS AND BALANCED POLYMERIC CENTRIFUGAL BLOWER WHEEL.

4. GRILLE: WHITE ENAMEL PAINTED METAL. 5. ACCESSORIES:

a. RECTANGULAR TO ROUND TRANSITIONS. b. HIGH-CAPACITY 24 GAUGE STEEL ROOF CAP WITH BLACK

ELECTRICALLY-BONDED EPOXY FINISH, SPRING-LOADED BACKDRAFT DAMPER AND BIRDSCREEN SIMILAR TO BROAN MODEL 437. 6. CAPACITIES AND CHARACTERISTICS: SEE DRAWINGS FOR SPECIFIC

PRODUCT INFORMATION

PART 3 - EXECUTION GENERAL ITEMS

A.PROVIDE SLEEVES AT ALL FLOOR, WALL OR PARTITION FLUSH WITH THE SURFACE EXCEPT SLEEVE THROUGH THE FLOOR SHALL EXTEND 2" ABOVE THE

AND MINIMUM ROD SIZES:

REQUIREMENTS

3.2 HANGERS AND SUPPORTS A. COMPLY WITH MSS SP-69 FOR PIPE HANGER SELECTION AND APPLICATIONS. B. PROVIDE HANGERS AND SUPPORTS AS REQUIRED FOR ALL HUNG PIPING AND

C.HANGERS SHALL BE PROPERLY FASTENED TO BUILDING STRUCTURE. PIPING AND DUCTWORK IS NOT TO BE SUPPORTED FROM OTHER PIPING OR D.PROVIDE COPPER CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN DIRECT CONTACT WITH COPPER PIPING. HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DI-ELECTRICALLY SEPARATED FROM ONE

E. HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DIAMETER OF INSULATION. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN PIPE INSULATION AND HANGER.

F. INSTALL HANGERS FOR PVC PIPING WITH THE FOLLOWING MAXIMUM SPACING

1. NPS 1 1/2 AND 2: MAXIMUM SPAN, 48 INCHES; MINIMUM ROD SIZE, 3/8 INCH.

HORIZONTAL BRANCH CONNECTION. SEE APPROPRIATE IAPMO

INSTALLATION STANDARD FOR EXPANSION AND OTHER SPECIAL

2. NPS 3: MAXIMUM SPAN, 48 INCHES; MINIMUM ROD SIZE, 1/2 INCH. 3. NPS 4: MAXIMUM SPAN, 48 INCHES; MINIMUM ROD SIZE, 5/8 INCH. 4. ALL SIZES: ALLOW FOR EXPANSION EVERY 30 FEET. SUPPORT AT EACH

G.INSTALL HANGERS FOR COPPER PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES: 1. NPS 3/4 AND SMALLER: MAXIMUM SPAN, 60 INCHES; MINIMUM ROD SIZE,

2. NPS 1 AND 1 1/2: MAXIMUM SPAN, 72 INCHES; MINIMUM ROD SIZE, 3/8 INCH. 3. NPS 2: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD SIZE, 3/8 INCH.

3.4 CLEANOUTS AND FLOOR DRAINS

H. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE", CHAPTER 5, HANGERS AND SUPPORTS FOR DUCTWORK AND HANGER SIZING AND SPACING REQUIREMENTS

3.3 EXCAVATION AND BACKFILLING A.PERFORM EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF UNDERGROUND PIPING

B. TRENCHES SHALL BE OF SUFFICIENT WIDTH. CRIB OR BRACES TRENCHES TO

PREVENT CAVE-IN OR SETTLEMENT. USE PUMPING EQUIPMENT IF REQUIRED. C.DO NOT EXCAVATE TRENCHES CLOSE TO COLUMNS AND WALLS WITHOUT

PRIOR CONSULTATION WITH THE ARCHITECT. D.BACKFILL TRENCHES WITH MINIMUM 6" LAYERS OF WELL TAMPED DRY EARTH TO PREVENT SETTLEMENT

3.4 PIPING COMMON REQUIREMENTS

A.SEE INDIVIDUAL PLUMBING AND HVAC SECTIONS FOR SPECIFIC PIPE REQUIREMENTS.

B. INSTALL PIPING TO PERMIT VALVE SERVICING. C.REAM ENDS OF PIPE AND REMOVE BURRS. BEVEL PLAIN ENDS OF PIPES.

F. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION.

D. REMOVE SCALE, SLAG, DIRT AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE AND FITTING BEFORE ASSEMBLY E. INSTALL PIPING FREE OF SAGS AND BENDS.

ASTM B 828 OR CDA'S "COPPER TUBE HANDBOOK," USING LEAD-FREE SOLDER ALLOY COMPLYING WITH ASTM B 32. H. THREADED JOINTS: THREAD PIPE WITH TAPERED THREADS ACCORDING TO ASME B1.20.1. CUT THREADS FULL AND CLEAN USING SHARP DIES. APPLY

APPROPRIATE TAPE OR THREAD COMPOUND TO EXTERNAL PIPE THREADS. DO NOT USE PIPE OR PIPE FITTINGS WITH THREADS THAT ARE CORRODED OR I. PLASTIC. NONPRESSURE-PIPING. SOLVENT-CEMENT JOINTS: CLEAN AND DRY JOINING SURFACES. JOIN PIPE AND FITTINGS ACCORDING TO THE FOLLOWING:

G.SOLDERED JOINTS: APPLY ASTM B 813, WATER-FLUSHABLE FLUX, UNLESS

PRIMERS, AND SOLVENT CEMENTS. 2. PVC PIPING: JOIN ACCORDING TO ASTM D 2855 AND ASTM D 2665

A.EXAMINE ALL VALVE COMPONENTS FOR CORROSION, CLEANLINESS, FULL MOVEMENT, FLANGE FACES AND ALL COMPONENTS FOR PROPER CONDITION. REPLACE ALL DEFECTIVE VALVES. B.LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT

C.LOCATE VALVES IN HORIZONTAL POSITION WITH STEM AT OR ABOVE CENTER

D. INSTALL VALVES IN POSITION TO ALLOW FULL STEM MOVEMENT

E. INSTALL VALVES WITH UNIONS OR FLANGES AT EACH PIECE OF EQUIPMENT TO ALLOW SERVICE, MAINTENANCE AND EQUIPMENT REMOVAL WITHOUT SYSTEM

SHUTDOWN.

AND TAPE JOINTS.

D. DOMESTIC COLD WATER PIPE:

E. DOMESTIC HOT WATER PIPE:

1-1/2 INCH THICK.

3.5 PLUMBING VALVE COMMON REQUIREMENTS

3.6 PIPING INSULATION A.EXTEND PIPING INSULATION WITHOUT INTERRUPTIONS THROUGH WALLS, FLOORS AND SIMILAR PENETRATIONS. B.INSTALL INSULATION WITH LONGITUDINAL SEAMS AT TOP AND END SEAMS

STAGGERED. BOND SEAMS AND JOINTS WITH ADHESIVE RECOMMENDED BY INSULATION MANUFACTURER. C.INSULATE ELBOWS AND TEE FITTINGS WITH PREFORMED FITTING INSULATION OF SAME MATERIAL AND THICKNESS AS USED FOR ADJACENT PIPE. IF PVC ELBOW COVERINGS ARE INSTALLED FILL VOIDS WITH FIBERGLASS INSULATION

1/2 INCH THICK. 2. 1-1/4" AND LARGER: MINERAL FIBER PREFORMED PIPE INSULATION TYPE I, 1 INCH THICK.

1. 1-1/4" AND SMALLER: MINERAL FIBER PREFORMED PIPE INSULATION TYPE I, 1 INCH THICK. 2. 1-1/2" AND LARGER: MINERAL FIBER PREFORMED PIPE INSULATION TYPE I,

1. 1" AND SMALLER: MINERAL FIBER PREFORMED PIPE INSULATION TYPE I,

#### B. INSTALL WITH ID TO CLOSELY FIT AROUND PIE, TUBE AND INSULATION AND THAT OD COMPLETELY COVERS THE OPENING

THE FOLLOWING:

A.UNDER-BUILDING-SLAB DOMESTIC WATER NPS 2 AND SMALLER USE ONE OF

A. INSTALL AT ALL PENETRATIONS OF WALLS, CEILINGS AND FINISHED FLOORS.

1. SOFT COPPER TUBE, ASTM B 88, TYPE K; WROUGHT COPPER, SOLDERED JOINT FITTINGS; AND BRAZED JOINTS. B. ABOVEGROUND DOMESTIC WATER NPS 2 AND SMALLER USE ONE OF THE

1. HARD COPPER TUBE, ASTM B 88, TYPE L; CAST OR WROUGHT COPPER, SOLDERED JOINT FITTINGS; AND SOLDERED JOINTS. C. UNDERGROUND SOIL AND WASTE USE ONE OF THE FOLLOWING:

1. SOLID WALL PVC PIPE, PVC SOCKET FITTINGS AND SOLVENT CEMENTED

D. ABOVEGROUND SOIL AND WASTE 1. SOLID WALL PVC PIPE, PVC SOCKET FITTINGS AND SOLVENT CEMENTED E. VENT PIPING NPS 4 AND SMALLER USE ONE OF THE FOLLOWING:

F. INSTALL ALL UNDER-BUILDING AND ABOVE GROUND DOMESTIC WATER PIPING WITH SLOPE FOR WINTER DRAINDOWN. PROVIDE DRAIN VALVES AT ALL LOW

G.INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING

1. SOLID WALL PVC PIPE, PVC SOCKET FITTINGS AND SOLVENT CEMENTED

1. HORIZONTAL SANITARY DRAINAGE PIPING: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW. 2. VENT PIPING: 1 PERCENT DOWN TOWARD VERTICAL FIXTURE VENT OR

MINIMUM SLOPES UNLESS OTHERWISE INDICATED:

TOWARD VENT STACK. L. INSTALL ABOVEGROUND PVC PIPING ACCORDING TO ASTM D 2665. M.INSTALL BELOWGROUND PVC PIPING ACCORDING TO ASTM D 2321.

N.INSTALL PVC PIPING ACCORDING TO ASTM D 2855 AND ASTM D 2665

A.IF VALVE APPLICATIONS ARE NOT INDICATED, USE THE FOLLOWING: SHUTOFF SERVICE: BALL B. SELECT VALVES WITH THE FOLLOWING END CONNECTIONS:

1. COPPER TUBE 2 NPS AND SMALLER: THREADED OR SOLDERED.

C.DOMESTIC HOT AND COLD WATER VALVES NPS 2 AND SMALLER:

1. BRONZE VALVES: MAY BE PROVIDED WITH SOLDER JOINT ENDS INSTEAD OF THREADED ENDS. 3.3 PLUMBING SPECIALTIFS

ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION.

1. INSTALL AT ALL POTENTIAL SOURCES OF CONTAMINATION

LOCATE IN SAME ROOM AS EQUIPMENT. INSTALL AIR GAP PIPED TO FLOOR DRAIN.

A. BACKFLOW PREVENTERS:

A. INSTALL CLEANOUTS ACCORDING TO THE FOLLOWING

6. WALL CLEANOUT WALL PLATES FLUSH WITH WALL

1. SAME SIZE AS DRAINAGE PIPE UP TO 4". 4" CLEANOUT ON PIPES LARGER

2. LOCATE AT EACH CHANGE OF DIRECTION GREATER THAN 45 DEGREES.

3. 50 FOOT INTERVAL IN 4" OR LESS AND 100 FEET FOR LARGER PIPE.

4. LOCATE AT BASE OF EACH VERTICAL SOIL OR WASTE STACK. 5. FLOOR CLEANOUT DECK PLATES FLUSH WITH FLOOR.

B.INSTALL FLOOR DRAINS AT LOW POINTS OF SURFACE TO BE DRAINED. SET GRATES FLUSH WITH FLOOR ACCORDING TO THE FOLLOWING: 1. INSTALL FLASHING COLLAR OR FLANGE SO NO LEAKAGE OCCURS

BETWEEN DRAIN AND FLOOR 2. INSTALL INDIVIDUAL TRAPS FOR FLOOR DRAINS CONNECTED TO SANITARY BUILDING DRAINS.

# 3.5 ELECTRIC WATER HEATERS

FITTING-TYPE HEAT TRAPS.

A.INSTALL ELECTRIC, DOMESTIC-WATER HEATERS LEVEL AND PLUMB, ACCORDING TO LAYOUT DRAWINGS, ORIGINAL DESIGN, AND REFERENCED STANDARDS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES. ARRANGE UNITS SO CONTROLS AND DEVICES NEEDING SERVICE ARE

B. EXTEND RELIEF VALVE PIPING TO WITHIN 6 INCHES OF THE FLOOR. C.INSTALL PIPING-TYPE HEAT TRAPS ON INLET AND OUTLET PIPING OF ELECTRIC, DOMESTIC-WATER HEATER STORAGE TANKS WITHOUT INTEGRAL OR OTHERWISE INDICATED, TO TUBE END. CONSTRUCT JOINTS ACCORDING TO

A.INSTALL FIXTURES LEVEL AND PLUMB. INSTALL SUPPORTS AFFIXED TO SUBSTRATE WITH WASTE FITTINGS AND SEALS WHERE APPLICABLE.

B. INSTALL HANDICAPPED FIXTURES AT HEIGHTS ACCORDING TO ICC/ANSI A117.1.

C. ATTACH WATER PIPING TO SUPPORTS OR SUBSTRATE WITHIN PIPE SPACES D.INSTALL PROTECTIVE SHIELDING PIPE COVERS AND ENCLOSURES ON EXPOSED WATER AND WASTE PIPING OF ACCESSIBLE LAVATORIES.

1. COMPLY WITH ASTM F 402 FOR SAFE-HANDLING PRACTICE OF CLEANERS, E. INSTALL WATER SUPPLY PIPING WITH STOPS ON EACH SUPPLY TO FIXTURE. F. SEAL JOINTS BETWEEN PLUMBING FIXTURES AND WALLS AND FLOORS USING SANITARY-TYPE, ONE-PART, MILDEW-RESISTANT SILICONE SEALANT.

3.7 FIELD QUALITY CONTROL

A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS 1. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT HAS BEEN INSPECTED AND APPROVED BY AUTHORITIES HAVING

LEAST ONE DAY BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION. 3. ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.

4. FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES

HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO

a. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE

2. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT

ENSURE COMPLIANCE WITH REQUIREMENTS

THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER. b. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT A SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED

ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW IT TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.

d. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS, AND RETEST

e. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION

b. ROUGHING-IN PLUMBING TEST PROCEDURE: TEST DRAINAGE AND

VENT PIPING EXCEPT OUTSIDE LEADERS ON COMPLETION OF

ROUGHING-IN CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH

ADDITIONAL AIR THROUGHOUT PERIOD OF INSPECTION. INSPECT

PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE

PLUMBING FIXTURE CONNECTIONS FOR GAS AND WATER LEAKS.

d. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST

PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE

c. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG

SANITARY DRAINAGE AND VENT PIPING TESTS: a. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF

WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10-FOOT HEAD OF WATER. FROM 15 MINUTES BEFORE INSPECTION STARTS TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP. INSPECT JOINTS FOR LEAKS. c. FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST CONNECTIONS AND PROVE THEY ARE GASTIGHT AND WATERTIGHT. PLUG VENT-STACK OPENINGS ON ROOF AND BUILDING DRAINS WHERE THEY LEAVE BUILDING INTRODUCE AIR INTO PIPING SYSTEM FOUAL TO PRESSURE OF 1-INCH WG. USE U-TUBE OR MANOMETER INSERTED IN TRAP OF WATER CLOSET TO MEASURE THIS PRESSURE. AIR PRESSURE MUST REMAIN CONSTANT WITHOUT INTRODUCING

B. SANITIZE THE ENTIRE DOMESTIC WATER SYSTEM WITH SOLUTION PERMITTED BY AUTHORITIES HAVING JURISDICTION FOR DURATION OF 24 HOUR MINIMUM. FLUSH SYSTEM WITH CLEAN CITY WATER UNTIL SOLUTION RESIDUE IS NO

C.REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY

# AUTHORITIES HAVING JURISDICTION.

INSULATION THICKNESS

METAL AND FLEXIBLE."

STANDARDS - METAL AND FLEXIBLE".

PARALLEL OR PERPENDICULAR TO BUILDING LINES.

LONGER PRESENT

OBTAINED

OBTAINED.

REQUIRED

3.8 METAL DUCTWORK A.INSTALL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION

C.INSTALL DUCTS WITH FEWEST JOINTS POSSIBLE USING FACTORY OR SHOP FABRICATED FITTINGS AND BRANCH CONNECTIONS D.INSTALL DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS AND

E.DUCT SEALING: PER SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -

B.INSTALL DUCTS WITH CLEARANCE OF 1 INCH, PLUS ALLOWANCE FOR

F. DUCT SCHEDULE: GALVANIZED UNLESS NOTED. 1. EXHAUST DUCTS: 1 INCH NEGATIVE OR POSITIVE PRESSURE CLASS, SEAL CLASS B IF NEGATIVE AND SEAL CLASS A IF POSITIVE PRESSURE. 2. ELBOW CONFIGURATION: PER SMACNA'S "HVAC DUCT CONSTRUCTION

3. BRANCH CONFIGURATION: PER SMACNA'S "HVAC DUCT CONSTRUCTION

## 3.9 EXHAUST FANS A. INSTALL FANS LEVEL, PLUMB WITH CLEARANCE FOR MAINTENANCE.

B. SECURE ROOF MOUNTED UNITS WITH CADMIUM PLATED HARDWARE.

STANDARDS - METAL AND FLEXIBLE - ELBOW STANDARDS".

STANDARDS - METAL AND FLEXIBLE - BRANCH CONNECTION".

END OF SECTION

0

SHEET NO.

HEET 6 OF 6

# ELECTRICAL SYMBOLS AND ABBREVIATIONS

	DESIGNATION	MTG HT								
S	SYMBOL SCHEDULE NOTES									
	SYMBOLS COMPRISE A STANDARD LIST; NOT ALL SYMI	BOLS								
NUMBEF STANDA	B. MOUNTING HEIGHTS INDICATED ARE STANDARD. DIMENSIONAL NUMBERS INDICATED AT DEVICES SHALL OVERRIDE THESE STANDARDS. MOUNTING HEIGHTS ARE TO THE CENTER OF THE DEVICE, UNLESS NOTED OTHERWISE.									
CONSTR USED, /	C. MOUNTING HEIGHTS INDICATED ARE FOR STUD WALL CONSTRUCTION. WHEN BLOCK OR BRICK CONSTRUCTION IS USED, ADJUST MOUNTING HEIGHTS TO ALIGN DEVICE PLATES WITH RUNNING JOINT.									
D. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.										
GENERAL										
[]]	HEAVY DASHED LINE WEIGHT INDICATES EXISTING ITEM TO BE REMOVED									
	LIGHT SOLID LINE WEIGHT INDICATES EXISTING ITEM TO REMAIN									
	HEAVY SOLID LINE WEIGHT INDICATES NEW ITEM OR NEW LOCATION									
R	REMOVE EXISTING ITEM									
RL	REMOVE EXISTING ITEM AND RELOCATE AS INDICATED									
Х	EXISTING ITEM TO REMAIN									
NL	NEW LOCATION FOR RELOCATED ITEM									
	NOTES & TAGS									
XX   EQUIPMENT IDENTIFICATION TAG - SEE EQUIP SCHEE										
(#)	FEEDER SIZE TAG — SEE POWER RISER FEEDER SCH									
Œ#)	FEEDER SIZE TAG — SEE POWER RISER FEEDER SCHEDU	IEDUL								
Œ#)		IEDUL								
	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDU	IEDULI								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE	IEDULI								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG - SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG - SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG - SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN	IEDULI								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN  CONDUIT WITH BEND UP	IEDULI								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN  CONDUIT WITH BEND UP  CONDUIT WITH BUSHED END	IEDULI								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS  CONDUIT CONCEALED IN THE FLOOR OR BELOW  CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN  CONDUIT WITH BEND UP  CONDUIT WITH BUSHED END  CONDUIT WITH BREAK OR CONTINUATION  CIRCUIT HOME RUN  — L1 INDICATES PANEL	IEDULI								
E# # # # # # # # # # # # # # # # # # #	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS CONDUIT CONCEALED IN THE FLOOR OR BELOW CONDUIT EXPOSED ON THE CEILING OR WALLS CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN CONDUIT WITH BEND UP  CONDUIT WITH BUSHED END  CONDUIT WITH BREAK OR CONTINUATION  CIRCUIT HOME RUN  L1 INDICATES PANEL  NUMBERS INDICATE CIRCUITS  CONDUCTOR COUNT — UNLESS NOTED OTHERWISE  SHORT HASH INDICATES 1#12 LINE  LONG HASH INDICATES 1#12 NEUTRAL	IEDUL								
(E#)	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDUKEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS CONDUIT CONCEALED IN THE FLOOR OR BELOW CONDUIT EXPOSED ON THE CEILING OR WALLS CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN CONDUIT WITH BEND UP  CONDUIT WITH BUSHED END  CONDUIT WITH BREAK OR CONTINUATION  CIRCUIT HOME RUN  — L1 INDICATES PANEL  — NUMBERS INDICATE CIRCUITS  CONDUCTOR COUNT — UNLESS NOTED OTHERWISE  / SHORT HASH INDICATES 1#12 LINE  / LONG HASH INDICATES 1#12 NEUTRAL  / HASH W/ DOT INDICATES 1#12 GROUND	IEDUL								
E# # # # # # # # # # # # # # # # # # #	ELEC EQUIP CONNECTION TAG — SEE EQUIP SCHEDL KEYNOTE  MISCELLANEOUS NOTE  RACEWAYS  CONDUIT CONCEALED IN THE CEILING OR WALLS CONDUIT CONCEALED IN THE FLOOR OR BELOW CONDUIT EXPOSED ON THE CEILING OR WALLS CONDUIT BURIED UNDERGROUND (# = DEPTH)  CONDUIT WITH BEND DOWN  CONDUIT WITH BEND UP  CONDUIT WITH BUSHED END  CONDUIT WITH BREAK OR CONTINUATION  CIRCUIT HOME RUN  L1 INDICATES PANEL  NUMBERS INDICATE CIRCUITS  CONDUCTOR COUNT — UNLESS NOTED OTHERWISE  / SHORT HASH INDICATES 1#12 LINE  / LONG HASH INDICATES 1#12 GROUND  PULL BOX, SIZE AS NOTED	IEDUL								

SYMBOL	DESIGNATION	MTG HT
	LIGHTING	
<sub>b</sub> O	LIGHT FIXTURE ID — REFER TO LT FIXT SCHEDULE (FIXT SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A — INDICATES LIGHT FIXTURE TYPE # — INDICATES CIRCUIT NUMBER b — INDICATES SWITCHING	
	LIGHT FIXTURE CIRCUIT TYPE  - NO HATCH INDICATES NORMAL CIRCUIT  - ANGLED HATCH INDICATES CRITICAL CIRCUIT  - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT	
0 0	TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED  — CEILING MOUNT	
<b>⊢</b>	CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED	
0	DOWNLIGHT CLG FIXT, RECESSED OR SURFACE MNT	
<b>\$</b>	CEILING WALL WASH FIXT, AIMED AS INDICATED	
0	SMALL WALL MOUNT FIXTURE OR SCONCE	VERIFY
Ç	LINEAR WALL MOUNT FIXT, LENGTH AS INDICATED	VERIFY
	UNDER CABINET FIXTURE, LENGTH AS INDICATED	
<del></del>	TRACK FIXTURE, NUMBER OF HEADS AS INDICATED	
알	EMERGENCY BATTERY LIGHT — WALL/CLG MNT	VERIFY
<b>♣</b> \$⊗	EXIT LIGHT, FILLED QUADRANT INDICATES FACES  - WALL/CEILING MOUNT	VERIFY
	SITE LIGHTING POLE FIXT, ROUND/RECTANGLE HEAD  - NUMBER OF HEADS AS INDICATED	
O 🗆	SITE LIGHTING POLE TOP FIXT, ROUND/RECT HEAD SPORTS LIGHTING ASSEMBLY	
<del>\$\$\$\$</del>	SPORTS LIGHTING ASSEMBLY	
	POWER	
	BRANCH CIRCUIT PANEL	VERIFY
	DISTRIBUTION PANEL OR SWITCHBOARD	VERIFY
	EQUIPMENT CABINET	VERIFY
38	TRANSFORMER	VERIFY
$\overline{Q}$	MOTOR OR MOTOR CONNECTION	VERIFY
$\boxtimes$	MOTOR CONTROLLER, STARTER, OR VFD	VERIFY
$\boxtimes$	COMBINATION STARTER & DISCONNECT SWITCH	VERIFY
	DISCONNECT SWITCH	VERIFY
\$ <sup>MR</sup>	MOTOR RATED TOGGLE SWITCH	VERIFY
\$ <sup>MMS</sup>	MANUAL MOTOR STARTER SW W/THERM OVERLOAD	VERIFY
0 0	SINGLE RECEPTACLE - WALL/CEILING MOUNT	18"
<b>+</b> +	DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"
<b>\(\Phi\)</b>	EMERGENCY DUPLEX RECEPTACLE — WALL MOUNT	18"
<b>\(\beta\)</b>	SPLIT WIRED DUPLEX RECEPTACLE — WALL MOUNT	18"
#	QUADPLEX RECEPTACLE — WALL MOUNT	18"
<del>*</del>	EMERGENCY QUADPLEX RECEPTACLE— WALL MOUNT	18"
= #	GFI RECEPTACLE, DUPLEX/QUADPLEX- WALL MOUNT	18"
<b>→</b> c	CLOCK RECEPTACLE — WALL MOUNT	96"
<b>④ ●</b>	SPECIAL PURPOSE RECEPTACLE — WALL/CLG MNT	18"
	FLOOR BOX- DEVICES AS INDICATED	
● ●	_	
<b>© ©</b> ⊕	POWER POLE - DEVICES AS INDICATED	
	POWER POLE - DEVICES AS INDICATED  MULTIOUTLET ASSEMBLY - DEVICES AS INDICATED	VERIFY

SYMBOL	DESIGNATION	MTG HT					
	SWITCHES & CONTROLS						
\$	SINGLE POLE TOGGLE SWITCH	48"					
<b>\$</b> <sup>2</sup>	DOUBLE POLE TOGGLE SWITCH						
<b>\$</b> <sup>3</sup>	THREE WAY TOGGLE SWITCH						
<b>\$</b> <sup>4</sup>	FOUR WAY TOGGLE SWITCH						
<b>\$</b> °	TOGGLE SWITCH — "a" INDICATES SWITCHING						
<b>\$</b>	PILOT LIGHT TOGGLE SWITCH						
<b>\$</b> "∟	ILLUMINATED TOGGLE - TOGGLE SWITCH						
<b>\$</b> <sup>K</sup>	KEYED SWITCH						
\$ <sup>MC</sup>	MOMENTARY CONTACT TOGGLE SWITCH						
\$ <sup>TS</sup>	TIMER SWITCH						
-D #	DIMMER SWITCH (# = WATTAGE)						
<b>-</b> ③	OCCUPANCY/VACANCY SENSOR - WALL/CLG MOUNT	12"BFC					
\$°°c	OCCUPANCY SENSOR WALL SWITCH	48"					
•0	PHOTO ELECTRIC CELL	VERIFY					
<b>-</b> TO	TIME CLOCK	60"					
<b>-</b> C	CONTACTOR	60"					
-R	RELAY	VERIFY					
-B	BADGE READER	VERIFY					
Ф	ELECTRIC THERMOSTAT	60"					
	PUSH-BUTTON STATION - BUTTONS AS INDICATED	48"					

Е	LECTRICAL ABBREVIATIONS
A, AMP AA AC ADD	AMPERES AUDIBLE ALARM ABOVE COUNTER
AFC AFCI AFF	ADDENDUM AVAILABLE FAULT CURRENT ARC FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR
AHU AL ANT	AIR HANDLING UNIT ALUMINUM ANTENNA
ATS BAS BFC BPS	AUTOMATIC TRANSFER SWITCH BUILDING AUTOMATION SYSTEM BELOW FINISHED CEILING BOLTED PRESSURE SWITCH
C CAB CB CCTV	CONDUIT CABINET CIRCUIT BREAKER CLOSED CIRCUIT TV
CKT CU DN	CIRCUIT COPPER DOWN
EC ELEC EM EMT	ELECTRICAL CONTRACTOR ELECTRIC or ELECTRICAL EMERGENCY ELECTRICAL METALLIC TUBING
ENCL EP EPO	ENCLOSURE ELECTRIC PNEUMATIC EMERGENCY POWER OFF ELECTRIC WATER COOLER
EWC F FA FACP	FUSE OR FUSED FIRE ALARM FIRE ALARM CONTROL PANEL
FSD FV G, GND GFI	FIRE—SMOKE DAMPER FILM VIEWER GROUND GROUND FAULT INTERRUPTER
IG JBOX KV KVA	ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT—AMP
KW KWH MC	KILOWATT KILOWATT—HOUR MOMENTARY CONTACT
MCB MLO MRS MSB	MAIN CIRCUIT BREAKER MAIN LUG ONLY MOTOR RATED SWITCH MAIN SWITCHBOARD
MT NC NEC NIC	EMPTY NORMALLY CLOSED NATIONAL ELECTRICAL CODE NOT IN CONTRACT
NL NO NTS	NEW LOCATION FOR RELOCATED ITEM NORMALLY OPEN NOT TO SCALE
OC PB PB PE	ON CENTER PULL BOX PUSH-BUTTON PNEUMATIC ELECTRIC
PF PH PNL PRI	POWER FACTOR PHASE PANEL PRIMARY
R RECEPT REFG	REMOVE EXISTING ITEM RECEPTACLE REFRIGERATOR
RL RTU SEC SPKR	REMOVE EXISTING ITEM AND RELOCATE AS INDICATED ROOF TOP UNIT SECONDARY SPEAKER
SW SWBD TEL TR	SWITCH SWITCHBOARD TELEPHONE TAMPER RESISTANT
TSTAT TYP UC UG	THERMOSTAT TYPICAL UNDER COUNTER UNDERGROUND
UH UNO V	UNIT HEATER UNLESS NOTED OTHERWISE VOLT
VA VAC VDC W	VOLT—AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT OR WIRE
WP X XFMR	WEATHERPROOF EXISTING ITEM TO REMAIN TRANSFORMER

NOTE:
REFER TO MOTOR AND EQUIPMENT SCHEDULES FOR ADDITIONAL
MOTOR ABBREVIATIONS.

# ELECTRICAL SHEET INDEX:

E0.0 ELECTRICAL COVER SHEET E1.0 LIGHTING PLAN E2.0 POWER PLANS E3.0 ELECTRICAL SPECIFICATIONS E3.1 ELECTRICAL SPECIFICATIONS

SHEET NO. E0.0

SHEET 1 OF 5

SHEET NO. E1.0

SHEET 2 OF 5

C1 **O** 28 C1 20 **O**a C1 20**O**<sub>a</sub> C1 20 **O** a C1 20**O** a C1 **O** 28 C1 Od 24 RCTC STORAGE UTILITY ROOM 90" Oc 22 W O 22 C1 22 **O**b 22 **O** b 22 **O**b C1 C1 C1 LIGHTING SCHEDULE FIXTURE MANUFACTURER/ CATALOG LAMP VOLTAGE NOTES KEY NOTES: WILLIAMS R60-90-PAR38/MED-CS CREE LED 90W 120V OR EQUAL REPLACEMENT  $\langle 1 \rangle$  provide a weather resistant dual technology occupancy 1500 LUMEN SENSOR. PROVIDE THE NUMBER OF SENSORS REQUIRED TO PAR38 OR PROVIDE SUFFICIENT COVERAGE TO THE AREA IN WHICH IT IS APPROVED INSTALLED. SET TIME-TO-OFF AT 15 MINUTES. EQUAL 2 PROVIDE SWITCH CONTROL FOR EXTERIOR LIGHTS IN THIS 32W, 2533 LUMEN, 4000K 120V LOCATION. MOUNT SWITCHES AT 66". SWITCH "c" TO BE TWR1LED-1-40K-MVOLT-PE-XX OR CONTROLLED TO OFF WHEN TYPE "b" FIXTURES ARE ON. APPROVED EQUAL LITHONIA DSXW1LED-20C-700-120V 47W, 4761 LUMEN, 4000K LED 40K-TFTM-120-XX-PE OR APPROVED EQUAL COORDINATE FIXTURE COLOR WITH ARCHITECT. 2. VERIFY LAMPS PROVIDED FIT FIXTURE PRIOR TO PURCHASE OF FIXTURE.

22**O**<sub>b</sub>

C1 20 **O**<sub>a</sub>

C1 20 **O**a

C1 **O** 28

C1 **O** 28

C1 **O** 28

C1 **O** 28

C1 20**O**<sub>a</sub>

C1 20**O**<sub>a</sub>

COVERED SEATING

C1 22**0**<sub>b</sub>

22 **O**b 22**0**b 22 **O**b C1 C1 C1

STORAGE ROOM
1 104

(S) (1) WP

C1 **O** 24

C1 C1 O O 24JMPIRE ROOM 24

(S) (1) WP

C1 **O** 24

C1 **O** 24

C1 **O** 24

C1 22**O**<sub>b</sub>

S WP

C1 22**O**<sub>b</sub>

C1 22**O**<sub>b</sub>

C1 20 **O**a

C1 20 **O**a

C1 20 **O**a

C1 20 **O** a

COVERED SEATING

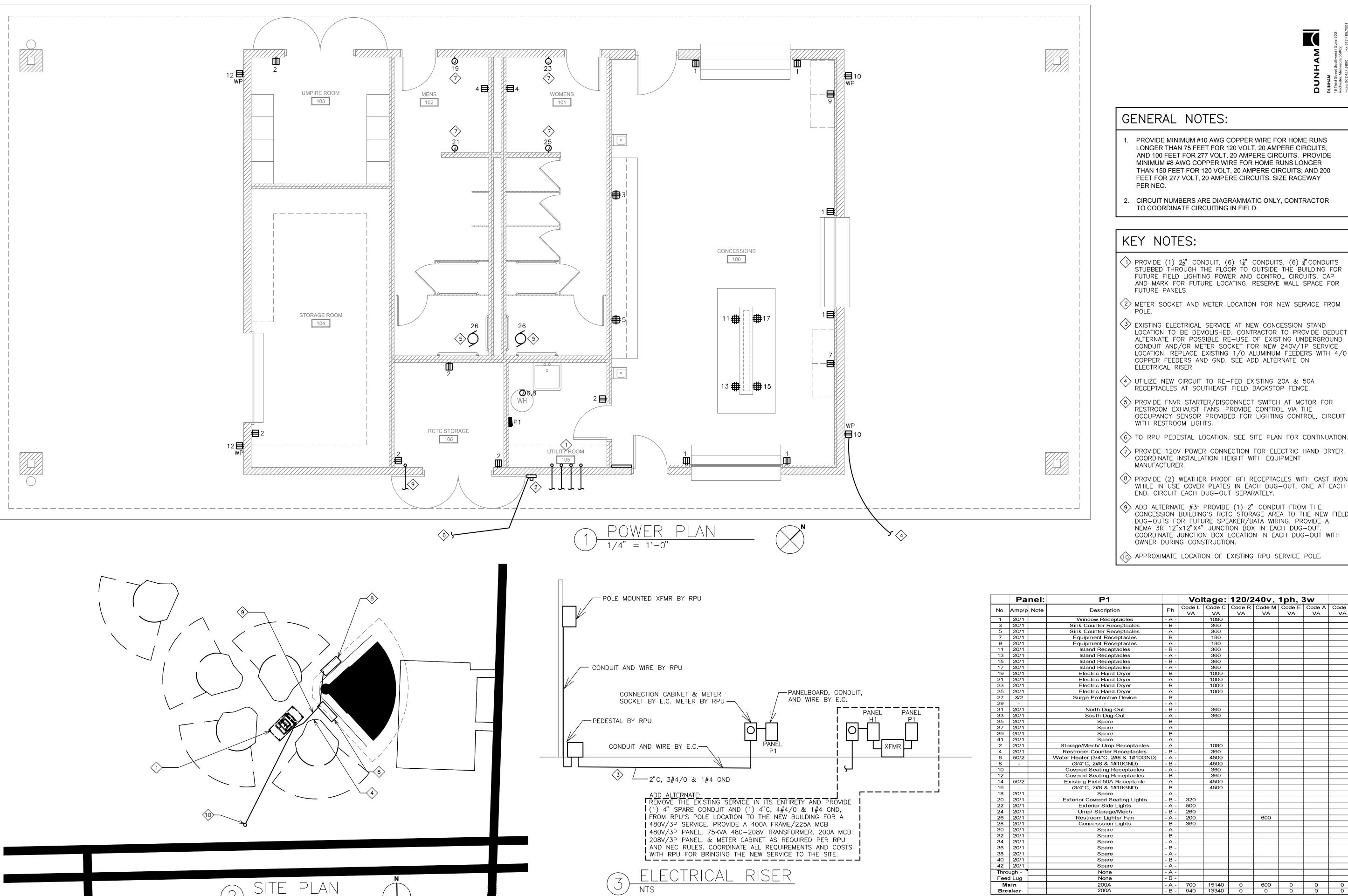
C1 20 **O** 

C1 20 **O** 

C1 20 **O** 

C1 20 **O** 

22 184"**O** W1



1/64" = 1'-0"



- LONGER THAN 75 FEET FOR 120 VOLT, 20 AMPERE CIRCUITS; AND 100 FEET FOR 277 VOLT, 20 AMPERE CIRCUITS. PROVIDE MINIMUM #8 AWG COPPER WIRE FOR HOME RUNS LONGER THAN 150 FEET FOR 120 VOLT, 20 AMPERE CIRCUITS; AND 200 FEET FOR 277 VOLT, 20 AMPERE CIRCUITS. SIZE RACEWAY
- 2. CIRCUIT NUMBERS ARE DIAGRAMMATIC ONLY, CONTRACTOR
- PROVIDE (1) 2½" CONDUIT, (6) 1½" CONDUITS, (6) ¾"CONDUITS STUBBED THROUGH THE FLOOR TO OUTSIDE THE BUILDING FOR FUTURE FIELD LIGHTING POWER AND CONTROL CIRCUITS. CAP AND MARK FOR FUTURE LOCATING. RESERVE WALL SPACE FOR
- (2) METER SOCKET AND METER LOCATION FOR NEW SERVICE FROM
- $\langle 3 \rangle$  EXISTING ELECTRICAL SERVICE AT NEW CONCESSION STAND LOCATION TO BE DEMOLISHED. CONTRACTOR TO PROVIDE DEDUCT ALTERNATE FOR POSSIBLE RE-USE OF EXISTING UNDERGROUND CONDUIT AND/OR METER SOCKET FOR NEW 240V/1P SERVICE LOCATION. REPLACE EXISTING 1/0 ALUMINUM FEEDERS WITH 4/0 COPPER FEEDERS AND GND. SÉE ADD ALTERNATE ON
- RECEPTACLES AT SOUTHEAST FIELD BACKSTOP FENCE.
- PROVIDE FNVR STARTER/DISCONNECT SWITCH AT MOTOR FOR RESTROOM EXHAUST FANS. PROVIDE CONTROL VIA THE OCCUPANCY SENSOR PROVIDED FOR LIGHTING CONTROL, CIRCUIT
- (6) TO RPU PEDESTAL LOCATION. SEE SITE PLAN FOR CONTINUATION.
- COORDINATE INSTALLATION HEIGHT WITH EQUIPMENT
- WHILE IN USE COVER PLATES IN EACH DUG-OUT, ONE AT EACH
- (9) ADD ALTERNATE #3: PROVIDE (1) 2" CONDUIT FROM THE CONCESSION BUILDING'S RCTC STORAGE AREA TO THE NEW FIELD DUG-OUTS FOR FUTURE SPEAKER/DATA WIRING. PROVIDE A NEMA 3R 12"x12"X4" JUNCTION BOX IN EACH DUG-OUT. COORDINATE JUNCTION BOX LOCATION IN EACH DUG-OUT WITH
- 10 APPROXIMATE LOCATION OF EXISTING RPU SERVICE POLE.

	Panel:	P1		Vol	tage:		20/240v, 1ph, 3w			
No.	Amp/p Note	Description	Ph	Code L VA	Code C VA	Code R VA	Code M VA	Code E VA	Code A VA	Code [ VA
1	20/1	Window Receptacles	- A -		1080					
3	20/1	Sink Counter Receptacles	- B -		360					
5	20/1	Sink Counter Receptacles	- A -		360					
7	20/1	Equipment Receptacles	- в -		180					
9	20/1	Equipment Receptacles	- A -		180					
11	20/1	Island Receptacles	<del>- в -</del>		360					
13	20/1	Island Receptacles	- A -		360					
15	20/1	Island Receptacles	<del>- в -</del>		360					
17	20/1	Island Receptacles	- A -		360					
19	20/1	Electric Hand Dryer	- в -		1000					
21	20/1	Electric Hand Dryer	- A -		1000					
23	20/1	Electric Hand Dryer	- B -		1000					
25	20/1	Electric Hand Dryer	- A -		1000					
27	X/2	Surge Protective Device	- B -							
29	-	<u>-</u>	- A -							
31	20/1	North Dug-Out	- B -		360					
33	20/1	South Dug-Out	- A -		360					
35	20/1	Spare	- B -							
37	20/1	Spare	- A -							
39	20/1	Spare	- B -							
41	20/1	Spare	- A -							
2	20/1	Storage/Mech/ Ump Receptacles	- A -		1080					
4	20/1	Restroom Counter Receptacles	- B -		360					
6	50/2	Water Heater (3/4"C, 2#8 & 1#10GND)	- A -		4500					
8	-	(3/4"C, 2#8 & 1#10GND)	- B -		4500					
10		Covered Seating Receptacles	- A -		360					
12		Covered Seating Receptacles	- B -		360					
14	50/2	Existing Field 50A Receptacle	- A -		4500					
16	-	(3/4"C, 2#8 & 1#10GND)	I-В-		4500					
18	20/1	Spare	- A -							
20	20/1	Exterior Covered Seating Lights	I-В-	320						
22	20/1	Exterior Side Lights	- A -	500						
24	20/1	Ump/ Storage/Mech	- B -	260						
26	20/1	Restroom Lights/ Fan	- A -	200			600			
28	20/1	Concesssion Lights	- B -	360						
30	20/1	Spare	- A -							
32	20/1	Spare	- B -							
34	20/1	Spare	- A -							
36	20/1	Spare	- B -							
38	20/1	Spare	- A -							
40	20/1	Spare	- B -							
42	20/1	Spare	- A -							
Thro	ough -	None	- A -							
	d Lug	None	- B -							
	ain	200A	- A -	700	15140	0	600	0	0	0
	aker	200A	- B -	940	13340	0	0	0	0	0

SHEET NO.

SHEET 3 OF 5

#### 1.1 GENERAL CONDITIONS

- A. THE GENERAL, SPECIAL, AND OTHER CONDITIONS OF THE ARCHITECTURAL. MECHANICAL AND VENDOR DOCUMENTS SHALL BE CONSIDERED AN INTEGRAL PART OF THESE ELECTRICAL SPECIFICATIONS.
- B. REFERENCE TO "CONTRACTOR" IN THIS SPECIFICATION SHALL MEAN "ELECTRICAL CONTRACTOR (EC)", UNLESS OTHERWISE NOTED. WORK SPECIFIED HEREIN IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE.

## 1.2 SCOPE OF WORK

- A.FURNISH LABOR, MATERIALS, EQUIPMENT, TOOLS, AND OTHER ITEMS NECESSARY FOR, OR INCIDENTAL TO, INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM AS REQUIRED FOR THIS PROJECT.
- B. ALSO INCLUDE OTHER WORK AND MISCELLANEOUS EQUIPMENT NOT SPECIFICALLY MENTIONED, BUT REASONABLY INFERRED, THAT ARE REQUIRED FOR A FULLY FUNCTIONAL AND TESTED SYSTEM.

#### 1.3 DRAWINGS AND DOCUMENTS

- A. THE DRAWINGS AND SPECIFICATIONS FORM A COMPLETE SET OF PLANS FOR THE ELECTRICAL WORK FOR THIS PROJECT. WHAT IS REQUIRED BY EITHER SHALL BE AS BINDING AS IF REQUIRED BY BOTH. IN THE EVENT THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT, THE GREATER REQUIREMENT OR COST SHALL BE INCLUDED IN BID, OR IF TIME, A CLARIFICATION WILL BE
- B. BIDDERS SHALL EXAMINE OTHER TRADE AND EQUIPMENT VENDOR DRAWINGS AND SPECIFICATIONS TO AVOID OMISSIONS, DUPLICATIONS, AND TO INSURE COMPLETE INSTALLATION OF ELECTRICAL WORK.
- C.THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW APPROXIMATE LOCATION ONLY. PLACEMENT OF ELECTRICAL EQUIPMENT AND DEVICES SHALL NOT INTERFERE WITH LOCATIONS OR CLEARANCES OF OTHER TRADES' MATERIALS OR EQUIPMENT. COORDINATE THE PLACEMENT OF ELECTRICAL DEVICES WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS.
- D. THE DIRECT ROUTING OF CONDUITS AND WIRING IS NOT ASSURED. EXACT REQUIREMENTS SHALL BE GOVERNED BY THE CONDITIONS OF THE PROJECT SITE. EXTRA LENGTHS OF WIRING OR THE ADDITION OF PULL OR JUNCTION BOXES, ETC., NECESSITATED BY SUCH CONDITIONS, SHALL BE INCLUDED IN
- E. DRAWING REPRESENTATIONS: CONDUITS, CIRCUITING, DEVICES, SPEAKERS, ETC., SHOWN ON THE DRAWINGS AS EXISTING ARE BASED ON EXISTING PLANS AND MAY NOT BE INSTALLED AS ORIGINALLY SHOWN. VERIFY THE ACCURACY OF THE "EXISTING CONDITIONS" AS SHOWN ON THE DRAWINGS AS THE DEMOLITION WORK PROGRESSES. PERFORM MODIFICATIONS AND ADDITIONS AS NECESSARY TO CORRECT FOR THESE HIDDEN CONDITIONS AND ALLOW FOR THE COMPLETION OF THE WORK.

#### 1.4 CODES, INSPECTIONS, AND FEES

- A. THE COMPLETED ELECTRICAL INSTALLATION SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS APPLICABLE FEDERAL, STATE, AND LOCAL CODES, REGULATIONS, AND STANDARDS INCLUDING INTERPRETATIONS BY APPROPRIATE AUTHORITIES HAVING JURISDICTION. WHERE THE DRAWINGS AND SPECIFICATIONS CALL FOR WORKMANSHIP OR MATERIALS IN EXCESS OF CODE OR REGULATORY REQUIREMENTS, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN.
- B. THE WORK SPECIFIED HEREIN SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY STATE AND LOCAL AUTHORITIES HAVING JURISDICTION AND THE ENGINEER. THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS TO HAVE THE ELECTRICAL WORK INSPECTED BY APPROPRIATE INSPECTOR(S) AND SHALL PROVIDE TWO (2) COPIES OF FINAL SIGNED "CERTIFICATE OF INSPECTION" TO THE OWNER.
- C.OBTAIN AND PAY FOR LICENSES, PERMITS, FEES, AND CHARGES FOR WORK INSTALLED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE TO PAY FEES AND CHARGES LEVIED BY THE ELECTRIC UTILITY COMPANY FOR CONNECTION TO ELECTRIC SERVICES. PROVIDE EQUIPMENT AND COORDINATE ELECTRICAL SERVICE REQUIREMENTS PER RPU RULES AND REGULATIONS REGARDING INSTALLATIONS.

# 1.5 JOB SITE SAFETY

- A. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ELECTRICAL JOB SITE SAFETY, INCLUDING SAFETY OF PEOPLE AND PROPERTY DURING PERFORMANCE OF WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- B. NO ACT. DRAWING REVIEW OR CONSTRUCTION REVIEW BY THE OWNER. THE ENGINEERS OR THEIR CONSULTANTS, IS INTENDED TO INCLUDE REVIEW OF 1.11 DEMOLITION THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.

# 1.6 CONDITIONS AT THE SITE

- A.EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING BUILDING CONDITIONS AND LIMITATIONS PRIOR TO SUBMITTING BID. NO EXTRA PAYMENT WILL BE ALLOWED FOR WORK REQUIRED BECAUSE OF THESE CONDITIONS, OR IF INFORMATION IS VISIBLE OR READILY ATTAINABLE, FOR ANY LIMITATION OR MISUNDERSTANDING OF EXISTING CONDITIONS.
- B. ANY DISCREPANCIES FROM THESE DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT/ENGINEER PRIOR TO BID.
- C.AN EXISTING UTILITY SERVICE IS CURRENTLY IN PLACE ON THE SITE IN THE LOCATION OF THE NEW CONCESSION BUILDING. THIS SERVICE IS SMALLER THAN REQUIRED FOR THE NEW BUILDING AND WILL REQUIRE THE SERVICE BE SUPPLEMENTED OR REPLACED.

# 1.7 WORKMANSHIP AND CONTRACTOR QUALIFICATIONS

- A. INSTALL ELECTRICAL EQUIPMENT AND MATERIALS IN A NEAT AND COMPETENT MANNER BY PERSONS EXPERIENCED AND SKILLED IN THE TRADE. HAPHAZARD OR POOR INSTALLATION WILL BE CAUSE FOR REJECTION OF WORK. EXPOSED COMPONENTS OF THE ELECTRICAL SYSTEMS SHALL BE SQUARE AND TRUE WITH BUILDING LINES AND SURFACES.
- B. CONTRACTOR SHALL BE LICENSED IN THE STATE IN WHICH THE PROJECT IS

# 1.8 COORDINATION OF WORK

- A. GIVE CAREFUL CONSIDERATION TO THE WORK OF THE GENERAL, MECHANICAL AND OTHER CONTRACTORS/SUBCONTRACTORS ON THE PROJECT. ORGANIZE AND PHASE THE ELECTRICAL WORK SO THAT IT WILL NOT INTERFERE WITH THE WORK OF OTHER TRADES.
- B. DRAWINGS AND SPECIFICATIONS FOR OTHER TRADES AND GENERAL CONSTRUCTION DRAWINGS SHALL BE CONSULTED FOR COORDINATION INFORMATION, DETAILS, DIMENSIONS, ETC. COORDINATE SHAFTS, CHASES, FURRED SPACES, SUSPENDED CEILING, LOCATIONS OF EQUIPMENT, ETC. THE CONTRACTOR SHALL REVIEW THE MECHANICAL-ELECTRICAL DRAWINGS AND EQUIPMENT DRAWINGS OF OTHER DISCIPLINES, INCLUDING DATA, SECURITY, AUDIO-VIDEO, CLOSED CIRCUIT TELEVISION, PAGING, FIRE ALARM, AND KITCHEN. THE CONTRACTOR SHALL BE RESPONSIBLE TO REPORT ALL DISCREPANCIES BETWEEN THESE DRAWINGS TO THE ENGINEER PRIOR TO BIDDING FOR CLARIFICATION. SOLUTIONS TO UNREPORTED DISCREPANCIES WILL BE DETERMINED BY THE ENGINEER, WITH NO ADDITIONAL

#### COMPENSATION DUE TO THE CONTRACTOR.

- C. THE LOCATION OF EQUIPMENT OUTLETS AND WIRING SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT OR APPROVED SHOP DRAWINGS PRIOR TO ANY ROUGH IN WORK. NOTIFY ENGINEER OF ANY DISCREPANCIES.
- D. DIMENSIONS GIVEN ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. DIMENSIONS, WHETHER CALCULATED OR SCALED, SHALL BE VERIFIED IN THE FIELD.
- E. CHECK ACTUAL JOB CONDITIONS BEFORE FABRICATING WORK. COORDINATE WITH OTHER TRADES TO AVOID REWORK DUE TO FIELD CONDITIONS. CHANGES OR ADDITIONS, SUBJECT TO ADDITIONAL COMPENSATION, WHICH ARE MADE WITHOUT WRITTEN AUTHORIZATION AND AN AGREED PRICE, SHALL BE AT THE CONTRACTOR'S RISK AND EXPENSE.
- F. COORDINATE ROUTING OF CONDUIT AND WIRE CONCEALED IN WALLS, SOFFITS OR CEILINGS INSTALLED BY THE GENERAL CONTRACTOR. COORDINATE WORK TO CONCEAL ALL CONDUIT AND WIRE.
- G. VERIFY ITEMS SUCH AS DOOR SWINGS, WINDOW LOCATIONS, CASEWORK, ETC., BEFORE INSTALLING ANY ELECTRICAL EQUIPMENT OR DEVICES.
- H. MAKE MINOR ADJUSTMENTS TO WORK WHERE REQUESTED BY THE OWNER OR THE OWNER'S REPRESENTATIVE WHEN ADJUSTMENTS ARE NECESSARY FOR PROPER OPERATION AND WITHIN THE INTENT OF THE CONTRACT.

## 1.9 MATERIALS AND EQUIPMENT

- A.UNLESS OTHERWISE SPECIFIED, MATERIAL AND EQUIPMENT SHALL BE NEW AND MANUFACTURED BY APPROVED OR LISTED MANUFACTURERS. MATERIALS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF GOVERNING CODES.
- B. ALL MATERIAL AND EQUIPMENT SHALL BE LISTED AND LABELED BY UNDERWRITERS LABORATORIES, INC. (UL), AS CONFORMING TO ITS STANDARDS IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THAT TYPE OF MATERIAL OR EQUIPMENT.
- C.OBTAIN WRITTEN APPROVAL SEVEN DAYS PRIOR TO BID, TO USE ANY PROPOSED SUBSTITUTE MATERIAL OR EQUIPMENT BEFORE CONTRACTING TO PURCHASE SUCH SUBSTITUTES. THE OWNER RESERVES THE RIGHT TO REQUIRE THE REMOVAL OF ANY MATERIAL OR EQUIPMENT WHICH DOES NOT HAVE THIS WRITTEN APPROVAL AND WHICH DOES NOT COMPLY WITH THE SPECIFICATIONS, REGARDLESS OF THE STATE OF INSTALLATION OF SUCH EQUIPMENT.
- D. WHERE EQUIPMENT SUPPLIED BY THE CONTRACTOR HAS CHARACTERISTICS OTHER THAN AS SPECIFIED HEREIN, THE CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, REMOVE AND REPLACE THE ELECTRICAL WORK NECESSITATED BY THE SUBSTITUTED PRODUCT.

#### 1.10 TEMPORARY INSTALLATIONS

- A.COMPLY WITH THE OWNER AND GENERAL CONTRACTOR REQUIREMENTS. ELECTRICAL WORK TO BE IN CONFORMANCE WITH NEC ARTICLE 590, TEMPORARY INSTALLATIONS.
- B. CONTINUATION OF SERVICE: EXISTING SERVICE IS NOT REQUIRED TO BE MAINTAINED WHILE CONSTRUCTION IS IN PROGRESS. RESTORE CIRCUITS 1.15 CLEAN-UP WIRING WHICH ARE TO REMAIN BUT WERE DISTURBED DURING DEMOLITION BACK TO ORIGINAL CONDITION.
- C.ELECTRIC POWER SYSTEM: PROVIDE AN ELECTRICAL DISTRIBUTION SYSTEM OF SUFFICIENT SIZE, CAPACITY, AND POWER CHARACTERISTICS REQUIRED FOR CONSTRUCTION OPERATIONS.
- D. PROVIDE TEMPORARY ELECTRICAL SERVICE AS REQUIRED FOR THE PROJECT.
- 1. FOR SERVICE CONSTRUCTION OR SERVICE REVISIONS, COORDINATE WITH THE UTILITY TO PROVIDE TEMPORARY SERVICE FOR THE DURATION OF CONSTRUCTION SO AS NOT TO INTERFERE WITH SERVICE CONSTRUCTION. PAY FOR UTILITY CHARGES ASSOCIATED WITH THE TEMPORARY SERVICE INCLUDING ENERGY BILLS.
- E.LIGHTING: PROVIDE TEMPORARY LIGHTING WITH LOCAL SWITCHING THROUGHOUT THE CONSTRUCTION AREA. PROVIDES ADEQUATE ILLUMINATION FOR CONSTRUCTION OPERATIONS, OBSERVATIONS, INSPECTIONS, AND TRAFFIC CONDITIONS.
- F. SPARE LAMPS: PROVIDE AN ADDITIONAL 10% OF EACH TYPE OF LAMP USED ON THE PROJECT BUT NO FEWER THAN 8 LAMPS FOR OWNER STORAGE ON SITE.
- G.CLEAN AND RE-LAMP EACH LIGHT FIXTURE USED AS TEMPORARY AT END OF 1.17 REBATE PROGRAMS
- H.REMOVE THE TEMPORARY INSTALLATION OF ELECTRICAL EQUIPMENT. RACEWAY AND WIRE AT THE END OF THE PROJECT. PATCH AND SEAL SLEEVE

- A. WHERE ELECTRICAL WORK TO REMAIN IS DAMAGED OR DISTURBED IN THE COURSE OF THE WORK, REMOVE DAMAGED PORTIONS AND PROVIDE PRODUCTS OF EQUAL CAPACITY, QUALITY, AND FUNCTIONALITY.
- B. ACCESSIBLE WORK INDICATED TO BE DEMOLISHED: REMOVE EXPOSED ELECTRICAL INSTALLATION IN ITS ENTIRETY. REMOVAL OF EXISTING ELECTRICAL DISTRIBUTION SYSTEM EQUIPMENT INCLUDES EQUIPMENT'S ASSOCIATED WIRING, INCLUDING CONDUCTORS, CABLES, EXPOSED CONDUIT, SURFACE METAL RACEWAYS, BOXES, AND FITTINGS, BACK TO EQUIPMENT'S SOURCE OR AS INDICATED.

# 1.12 CUTTING AND PATCHING

- A. WORKMANSHIP; LAY OUT WORK IN ADVANCE. EXERCISE CARE WHERE CUTTING, CHANNELING, CHASING, OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS, OR OTHER SURFACES IS NECESSARY FOR PROPER INSTALLATION, SUPPORT, OR ANCHORAGE OF CONDUIT, RACEWAYS, OR OTHER ELECTRICAL WORK. REPAIR DAMAGE TO BUILDINGS, PIPING, AND EQUIPMENT USING SKILLED CRAFTSMEN OF TRADES INVOLVED
- B. PERFORM CORE DRILLING, CUTTING AND PATCHING NECESSARY FOR THE COMPLETION OF THE ELECTRICAL WORK FOR THIS PROJECT. NO STRUCTURAL MEMBERS SHALL BE DISTURBED WITHOUT OBTAINING WRITTEN PERMISSION OF THE ENGINEER.
- C.SURFACES WHICH ARE DISTURBED IN ANY WAY BY THE CONTRACTOR SHALL BE REPAIRED AND REFINISHED TO PROVIDE A SURFACE EQUAL IN STRENGTH, DURABILITY, AND APPEARANCE TO THE ORIGINAL SURFACE.
- D. WHERE IT IS NECESSARY TO DRILL OR CUT CONCRETE SURFACES, THE EDGES SHALL BE SHARPLY DEFINED. CORE HOLES SHALL BE MADE WITH A ROTARY DRILL. RECTANGULAR CONCRETE CUTS SHALL BE MADE WITH A CONCRETE SAW. DO NOT PENETRATE POST TENSION SLABS PRIOR TO X-RAYING FLOOR.
- E. ALL CUTTING, DRILLING, PATCHING, REPAIRING, AND REFINISHING SHALL BE DONE BY PERSONS SKILLED IN APPROPRIATE TRADES.
- F. CLEAN AWAY RUBBISH AND LITTER GENERATED DURING ELECTRICAL INSTALLATION.

# 1.13 SHOP DRAWINGS AND SUBMITTALS

A.SUBMIT SHOP DRAWINGS FOR ELECTRICAL EQUIPMENT IN \*.PDF FORMAT. SUBMIT ADDITIONAL HARD COPIES AS REQUIRED BY THE GENERAL CONTRACT. SHOP DRAWING SUBMITTALS SHALL ALLOW FOR A MINIMUM OF SEVEN WORKING DAYS FOR ENGINEER REVIEW.

- B. SHOP DRAWINGS SHALL BE DETAILED, DIMENSIONED MANUFACTURERS' DRAWINGS. EACH SET OF DOCUMENTS SHALL LIST THE PROJECT NAME AND 2.3 CONTROL VOLTAGE CONDUCTORS AND CABLES ADDRESS, AND CONTRACTOR'S NAME, ADDRESS, AND TELEPHONE NUMBER. AN INDEX PAGE SHALL LIST INDIVIDUALLY THE ITEMS IN THE SUBMITTAL WITH REFERENCES TO TYPE DESIGNATIONS OR OTHER IDENTIFIERS NOTED ON
- C. SUBMITTAL TO THE ENGINEER SHALL BE VIA THE GENERAL CONTRACTOR AND. WHERE REQUIRED, THE ARCHITECT. DO NOT SUBMIT INCOMPLETE SHOP DRAWINGS. SHOP DRAWINGS THAT ARE INCOMPLETE OR NOT SIGNED BY BOTH THE CONTRACTOR AND THE GENERAL CONTRACTOR SHALL BE RETURNED WITHOUT REVIEW.
- D. CROSS OUT ANY INFORMATION OR OPTIONS NOT BEING PROVIDED OR DOES NOT APPLY TO THE PROJECT. FAILURE TO DO SO ASSUMES THAT EQUIPMENT, OPTIONS, AND ACCESSORIES SHOWN IN THE SHOP DRAWING SUBMITTAL ARE
- E.IF THE CONTRACTOR USES MATERIALS OTHER THAN THOSE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT, AT NO ADDITIONAL
- F. THE APPROVAL STAMP ON THE SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OR THE SUPPLIER OF RESPONSIBILITY FOR FULL CONTRACT COMPLIANCE.

### 1.14 MAINTENANCE MANUAL AND RECORD DRAWINGS

- A.FURNISH THE OWNER WITH A MINIMUM OF TWO (2) PRINTED COPIES AND TWO (2) DIGITAL DATA DVD'S OF A MANUAL COVERING THE OPERATION AND MAINTENANCE OF EQUIPMENT PROVIDED UNDER THIS CONTRACT. SUBMIT ADDITIONAL COPIES AS REQUIRED BY THE GENERAL CONTRACT. THE MANUALS SHALL BE IN A 3-RING, LOOSE LEAF, HEAVY DUTY BINDER AND SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL. EACH MANUAL SHALL CONTAIN THE FOLLOWING:
- 1. COMPLETE MANUFACTURER CATALOG DATA, MANUFACTURER'S LITERATURE, WIRING DIAGRAMS, DETAILED OPERATING INSTRUCTIONS, AND A COMPLETE LISTING OF SUPPLIERS AND DISTRIBUTORS WHERE REPLACEMENT PARTS AND MAINTENANCE SERVICES ARE AVAILABLE FOR
- INSTALLED EQUIPMENT. INCLUDE ALL ELECTRICAL SHOP DRAWINGS. 2. PHYSICAL DESCRIPTION AND INSTALLATION INSTRUCTIONS, USER'S MANUAL AND OPERATING INSTRUCTIONS.
- 3. REPLACEABLE PARTS LIST. INCLUDE THE LIGHT FIXTURE SCHEDULE WITH REPLACEMENT LAMPS PER FIXTURE TYPE 4. INSPECTION CERTIFICATES, SIGNED BY THE APPROPRIATE INSPECTOR. 5. FULL LISTING OF PRODUCT WARRANTIES AND EXTENDED WARRANTIES
- WITH REGISTRATION AND CONTACT INFORMATION. 6. DATA DVD WITH INDEXED PDF DOCUMENTS OF ALL ITEMS IN THE MANUAL
- B.MARKUP A SET OF CONSTRUCTION DOCUMENTS AS WORK PROGRESSES. SHOW ACTUAL CIRCUIT ROUTING WITH DIMENSIONED INFORMATION, SIZES, TYPES, ETC., EQUIPMENT LOCATION CHANGES, AND ANY OTHER CHANGES OR DEVIATIONS BETWEEN PROJECT WORK, AS BUILT, AND THE CONTRACT DOCUMENTS. MARKINGS SHALL BE NEAT, LEGIBLE, AND PERMANENT. TRANSFER APPLICABLE MARKINGS TO A SECOND SET OF DOCUMENTS AND PROVIDE BOTH SETS OF RECORD DOCUMENTS TO THE OWNER.

- A.UPON COMPLETION OF THE WORK AND AT OTHER TIMES DIRECTED, REMOVE MATERIALS AND SCRAP GENERATED BY THE ELECTRICAL INSTALLATION AND LEAVE THE PREMISES IN A CLEAN AND ORDERLY CONDITION.
- B. CLEAN ELECTRICAL EQUIPMENT INTERIORS PRIOR TO ENERGIZING AND BEFORE FINAL ACCEPTANCE. CLEAN LIGHT FIXTURES LENSES, REFLECTORS AND TRIMS. REPAIR, CLEAN AND TOUCH UP MINOR SCRATCHES OR BLEMISHES ON FACTORY PAINTED EQUIPMENT.
- C.DAMAGED, DENTED OR REFURBISHED EQUIPMENT SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

# 1.16 ACCEPTANCE DEMONSTRATION AND TRAINING

- A.PERFORM SYSTEM START-UP, TESTING AND PROGRAMMING PRIOR TO OWNER'S TRAINING. DO NOT SCHEDULE DEMONSTRATIONS UNTIL SYSTEMS ARE FULLY OPERATIONAL AND READY TO TURN OVER TO THE OWNER.
- B.DEMONSTRATE TO THE OWNER THE OPERATION OF THE ELECTRICA INSTALLATIONS. THE TIMING OF THE DEMONSTRATION WILL BE DETERMINED BY THE OWNER UPON COMPLETION OF THE WORK.

A.PROVIDE THE OWNER WITH REBATE FORMS, FILLED OUT WITH APPLICABLE PROJECT INFORMATION, FOR UTILITY OR PRODUCT REBATE PROGRAMS TO WHICH THE OWNER IS ELIGIBLE.

# 1.18 GUARANTEES AND WARRANTIES

- A.FURNISH THE OWNER WITH A WRITTEN GUARANTEE FOR THE PERIOD OF ONE (1) YEAR AGAINST THE FAILURE OF ANY PART OF THE ELECTRICAL SYSTEMS INSTALLED DUE TO FAULTY MATERIAL OR WORKMANSHIP, WITHOUT ANY CHARGES, TO THE OWNER. GUARANTEE PERIOD TO START UPON SUBSTANTIAL COMPLETION OR AS SPECIFIED UNDER GENERAL AND SPECIAL CONDITIONS. INCANDESCENT AND HALOGEN LAMPS ARE EXCLUDED.
- B. EXTENDED WARRANTIES OR PRODUCT WARRANTIES EXCEEDING ONE (1) YEAR TO BE PASSED ON TO THE OWNER.

# PART 2 - PRODUCTS

# 2.1 GENERAL

- A. ALL MATERIALS MUST BE NEW AND BEAR UNDERWRITER'S LABORATORIES (UL) LABEL. MATERIALS THAT ARE NOT COVERED BY UL TESTING STANDARDS SHALL BE TESTED AND APPROVED BY AN INDEPENDENT TESTING LABORATORY OR A GOVERNMENTAL AGENCY. MATERIAL NOT IN ACCORDANCE WITH THESE SPECIFICATIONS MAY BE REJECTED EITHER BEFORE OR AFTER INSTALLATION.
- B. ALL EQUIPMENT AND DEVICE TERMINALS AND LUGS RATED FOR 60/75 OR 75 DEGREES C.

# 2.2 LOW VOLTAGE CONDUCTORS AND CABLES

- A. COPPER CONDUCTORS COMPLYING WITH NEMA WC 70/ICEA S-95-658.
- B. ALUMINUM CONDUCTORS ARE PROHIBITED.
- C.INSULATION TYPE: XHHW, XHHW-2, THHW, OR THWN-2, COLOR CODED, COLOR IMPREGNATED WIRE.
- D. CONDUCTOR SIZES ARE AMERICAN WIRE GAUGE (AWG) OR CIRCULAR MILS (KCMIL) AS FOLLOWS:
- 2. #10 AWG AND LARGER SHALL BE STRANDED COPPER.
- 3. BRANCH CIRCUITS TO BE COLOR CODED, COLOR IMPREGNATED WIRE.
- E. AC, CORE CLAD OR ROMEX CABLES ARE NOT ALLOWED.
- F. METAL-CLAD CABLE TYPE MC WITH GREEN GROUND CONDUCTOR ALLOWED ONLY WHERE NOTED IN PART 3 EXECUTION.
- G.CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO, OIL PROOF, HARD SERVICE CORD WITH STAINLESS-STEEL, WIRE-MESH, STRAIN RELIEF DEVICE AT TERMINATIONS TO SUIT APPLICATION.

- A.CONTROL CIRCUITS: CONDUCTORS NOT INSTALLED IN CONDUIT OR ARMOR JACKETED CABLE TO BE PLENUM RATED.
- 1. CLASS 1 CONTROL CIRCUITS: STRANDED COPPER, TYPE THWN OR XHHN,
- IN RACEWAY OR CABLE WITH ARMOR JACKET.
- 2. CLASS 2 CONTROL CIRCUITS: STRANDED COPPER, TYPE THWN OR XHHN, IN RACEWAY OR POWER-LIMITED CABLE CONCEALED IN BUILDING
- FINISHES; IN CABLE TRAY OR ON HANGERS ABOVE ACCESSIBLE CEILINGS. 3. CLASS 3 REMOTE-CONTROL AND SIGNAL CIRCUITS: STRANDED COPPER, TYPE TW OR TYPE TF, COMPLYING WITH UL 83. IN RACEWAY OR POWER-LIMITED CABLE CONCEALED IN BUILDING FINISHES; IN CABLE TRAY OR ON HANGERS ABOVE ACCESSIBLE CEILINGS.

## 2.4 GROUNDING AND BONDING

- A. CIRCUITS, METAL RACEWAY SYSTEMS, AND OTHER PERMANENTLY INSTALLED ELECTRICAL EQUIPMENT SHALL BE SOLIDLY GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE TO FORM A CONTINUOUS, PERMANENT AND EFFECTIVE GROUNDING SYSTEM.
- B. GROUNDING ELECTRODE CONDUCTOR CONNECTIONS SHALL BE MADE WITH SOLDERLESS PRESSURE TYPE FITTINGS. WHERE WELDED CONNECTIONS ARE PRACTICAL, CONNECTIONS MAY BE MADE BY THE USE OF SUITABLE WELDING PROCESS. MAKE CONNECTIONS IN STRICT CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- C.BOND FLEXIBLE RACEWAY SECTIONS WITH A BARE GROUND CONDUCTOR SEPARATE FROM THE EQUIPMENT GROUNDING CONDUCTOR INSTALLED WITH THE BRANCH OR FEEDER CONDUCTORS. INSTALL AN EXTERNAL GROUND CONDUCTOR WITH GROUNDING BUSHINGS WHERE REQUIRED.
- D.ISOLATED GROUND CONDUCTORS: GREEN COLORED INSULATION WITH
- E. GROUND RODS: 10'X3/4" COPPER CLAD STEEL. GROUND RODS AT EXTERIOR AREA LIGHTS: 8'X5/8" COPPER CLAD STEEL

## 2.5 HANGERS AND SUPPORTS

- A.FOR INDIVIDUAL CONDUIT RUNS NOT DIRECTLY FASTENED TO THE STRUCTURE, USE THREADED ROD AND HANGERS MANUFACTURED BY CADDY®, UNISTRUT® OR POWERSTRUT®.
- B. GALVANIZED STEEL SLOTTED CHANNEL SUPPORT SYSTEMS WITH FITTINGS AND SUPPORTS BY THE SAME MANUFACTURER.

## 2.6 RACEWAYS AND OUTLET BOXES

- A.PROVIDE RACEWAYS, FITTINGS, CONNECTORS AND ACCESSORIES FOR A COMPLETE RACEWAY SYSTEM. RACEWAYS INCLUDE:
- 1. RIGID METAL CONDUIT (RMC): HOT-DIPPED GALVANIZED.
- 2. INTERMEDIATE METAL CONDUIT (IMC): HOT-DIPPED GALVANIZED.

OR WET LOCATIONS LESS THAN 6' LENGTHS.

- 3. ELECTRICAL METALLIC TUBING (EMT): ELECTRO-GALVANIZED. 4. POLYVINYL CHLORIDE CONDUIT (PVC) SCHEDULE 40 FOR BELOW GRADE
- 5. WIREWAYS: ENAMEL FINISH, HINGED TYPE.
- 6. FLEXIBLE METALLIC CONDUIT: FOR FINAL CONNECTION IN DRY LOCATIONS LESS THAN 6'LENGTHS. 7. LIQUID TIGHT FLEXIBLE METAL CONDUIT: FOR FINAL CONNECTION IN DAMP
- B. MINIMUM ELECTRICAL CONDUIT SIZE: 1/2 C". MINIMUM BRANCH CIRCUIT OR FEEDER HOME RUN: 3/4"C. MINIMUM CONTROL VOLTAGE AND MISCELLANEOUS SYSTEMS CONDUIT: 3/4"C.
- C.PROVIDE FITTINGS AND ACCESSORIES APPROVED FOR THE PURPOSE, LISTED FOR USE, WITH THE TYPE CONDUIT OR RACEWAY. EMT CONNECTORS AND COUPLINGS SHALL BE STEEL SETSCREW TYPE INDOORS AND STEEL

COMPRESSION TYPE IN DAMP OR WET LOCATIONS AND OUTDOORS.

- D. OUTLET BOXES: 4" SQUARE X 1-1/2" DEEP (OR LARGER) GALVANIZED SHEET STEEL KO-TYPE WITH PLASTER RING AND COVER FOR GENERAL INTERIOR USE. CAST METAL TYPE FS OR FD WITH MATCHING SCREW COVERS FOR EXTERIOR AND EXPOSED INTERIOR LOCATIONS (GASKETED IN DAMP OR WET LOCATIONS). LARGER BOXES AS REQUIRED; SIZED FOR NEC FILL.
- E. JUNCTION BOXES SHALL BE SAME AS OUTLET BOXES UP TO 42 CU. IN. USE CODE-GAUGE STEEL IN LARGER SIZES WITH SURFACE OR FLUSH-TYPE SCREW-MOUNTED TRIM COVERS. BOXES AND COVERS PAINTED WITH INHIBITOR-PRIMED PAINT INSIDE AND OUT.
- F. PULL BOXES SHALL BE SAME AS JUNCTION BOXES UNLESS INDICATED OTHERWISE ON THE DRAWINGS, WITH COVERS.
- G.LIGHT FIXTURES SHALL NOT BE USED AS A RACEWAY UNLESS LISTED AND MARKED AS A RACEWAY IN ACCORDANCE WITH NEC ARTICLE 410.64 AND AS NOTED IN PART 3 - EXECUTION.
- H.ELECTRICAL CONDUIT INSTALLATIONS MUST BE SUPPORTED PER NEC AND NOT EXCEED 10 FEET BETWEEN SUPPORTS.

# 2.7 UNDERGROUND RACEWAYS AND BOXES

A. SCHEDULE 40 PVC ELECTRICAL CONDUIT FOR BELOW GRADE INSTALLATIONS

WITH FITTINGS AND ACCESSORIES BY THE SAME MANUFACTURER.

- 1. SCHEDULE 80 PVC ELECTRICAL CONDUIT, FIBERGLASS ELECTRICAL CONDUIT, CONCRETE ENCASED ELECTRICAL CONDUIT, CONCRETE CAPPED ELECTRICAL CONDUIT OR CONCRETE DUCT BANKS AS SHOWN ON THE
- B. EXTERIOR BRANCH CIRCUIT OR FEEDER HANDHOLES TO BE CAST FIBERGLASS RESIN WITH OPEN BOTTOM AND HEAVY DUTY BOLTED COVER FOR NON-VEHICLE OR NON-PEDESTRIAN TRAFFIC SURFACES.

# 2.8 IDENTIFICATION AND LABELING

PLATES OR LEGEND PLATES.

- A.LABEL CONTROL DEVICES AND DEVICE ENCLOSURES WITH INDIVIDUAL NAME
- B. INDIVIDUAL NAME OR LEGEND PLATES: BLACK LAMINATED PLASTIC PLATES WITH WHITE CUT LETTERS. PAPER, FOIL OR TAPE MARKERS ATTACHED WITH ADHESIVES SHALL NOT BE USED.
- C.ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL, PUNCHED OR DRILLED FOR SCREW MOUNTING. WHITE LETTERS ON A DARK-GRAY BACKGROUND. 2.13 SURGE PROTECTIVE DEVICES (SPDS) MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH. LABEL THE FOLLOWING **EQUIPMENT**
- 1. PANELBOARDS, ELECTRICAL CABINETS, AND ENCLOSURES. 2. ACCESS DOORS AND PANELS FOR CONCEALED ELECTRICAL ITEMS.
- 3. ELECTRICAL BREAKERS IN EXISTING DISTRIBUTION PANELS. 4. TRANSFORMERS.

DEVICES.

- 5. EMERGENCY SYSTEM BOXES AND ENCLOSURES. DISCONNECT SWITCHES.
- 7. ENCLOSED CIRCUIT BREAKERS. 8. MOTOR STARTERS PUSH-BUTTON STATIONS
- 10. CONTACTORS 11. REMOTE-CONTROLLED SWITCHES, DIMMER MODULES, AND CONTROL
- 12. PANELS, TERMINAL CABINETS, AND RACKS. D. ACCESSIBLE RACEWAYS AND CABLES OF AUXILIARY SYSTEMS: IDENTIFY THE

FOLLOWING SYSTEMS AT PANEL AND JUNCTION BOX LOCATIONS WITHIN EACH

## 1. 120/208 VOLT: MARK COVERS WITH PANEL AND CIRCUIT NUMBERS.

E. RECEPTACLES: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVED. USE PRE MANUFACTURED HOT STAMPED OR ENGRAVED MACHINE PRINTING WITH BLACK FILLED LETTERING ON FACE OF PLATE, AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES.

#### 2.9 LIGHTING CONTROL DEVICES

- A.OUTDOOR PHOTOELECTRIC SWITCHES: SOLID STATE WITH DRY CONTACTS AND METAL OXIDE SURGE SUPPRESSOR. LIGHT-LEVEL MONITORING RANGE FROM 1.5 TO 10FC WITH ADJUSTABLE LEVELS FOR ON/OFF CONTROLS.
- B. AUTOMATIC LIGHTING CONTROL DEVICES: OPERATION SHALL TURN LIGHTS ON AUTOMATICALLY; LIGHTING SHALL TURN OFF WHEN UNOCCUPIED, WITH A TIME DELAY FOR TURNING LIGHTS OFF ADJUSTABLE OVER A RANGE OF 1 TO 15 MINUTES. FULL ON AUTOMATIC CONTROL SHALL TURN LIGHTS ON WHEN COVERAGE AREA IS OCCUPIED, AND TURN THEM OFF WHEN UNOCCUPIED; WITH A TIME DELAY FOR TURNING LIGHTS OFF, ADJUSTABLE OVER A MINIMUM
- 1. OCCUPANCY SENSOR: WALL OR CEILING MOUNT AS INDICATED ON PLANS. DUAL TECHNOLOGY SOLID STATE OCCUPANCY SENSOR WITH SEPARATE POWER PACK, WEATHER PROOF TYPE RATED FOR OUTDOOR USE.
- C. WALL BOX OCCUPANCY SENSORS: ADAPTIVE TECHNOLOGY WITH TIME DELAY, QUANTITY OF INTEGRAL SWITCHES AS SHOWN ON THE DRAWINGS (MINIMUM OF ONE (1) SWITCH).
- D. LIGHTING CONTACTORS: ELECTRICALLY OPERATED AND MECHANICALLY HELD. NON- FUSED SWITCH WITH 2 WIRE SOLID STATE CONTROL MODULES.

## 2.10PANELBOARDS

- A.PANELBOARDS: SCHNEIDER ELECTRIC STYLE #NQ (120/208V) FOR 100-400 AMPERE, BY EATON, OR SIEMENS.
- B. DEAD FRONT SAFETY TYPE WITH ENCLOSURES OF CODE GRADE STEEL. OVERSIZE GUTTERS SHALL BE PROVIDED FOR FEED THROUGH WHERE INDICATED OR REQUIRED. WHERE DOUBLE LUGS ARE NOT PERMITTED BY LOCAL CODE, A SUITABLE PULL BOX OR GUTTER ADJACENT TO PANELS SHALL BE PROVIDED FOR CONNECTIONS.
- C.TRIM AND FLAT LOCKING DOORS WITH BOTH HINGES AND TRIM CLAMPS COMPLETELY CONCEALED, DOOR IN DOOR CONSTRUCTION, FLUSH COVER DOOR LOCKS COMMON KEYED. PROVIDE TWO (2) KEYS FOR EACH PANELBOARD. MOUNT A CLEAR PLASTIC-COVERED TYPEWRITTEN CIRCUIT DIRECTORY IN A CARD HOLDER ATTACHED TO THE INNER SIDE OF THE DOOR. PROVIDE ENGRAVED LAMINATE NAMEPLATES STATING PANELBOARD NAME AND VOLTAGE.
- D.98 PERCENT ELECTROLYTIC COPPER OR 55 PERCENT CONDUCTIVITY ALUMINUM BUSSES INDEPENDENTLY SUPPORTED (WITHOUT DEPENDENCE UPON THE CIRCUIT BREAKERS). WHERE BREAKERS AND/OR SWITCHES ARE LISTED IN THE SCHEDULES AS "SPACE ONLY", INCLUDE EXTENDED BUS AND
- E.BOLT-ON CIRCUIT BREAKERS WITH BOLTED LINE AND LOAD TERMINALS, QUICK-MAKE, QUICK-BREAK, THERMAL MAGNETIC, COMMON TRIP ON MULTI-POLE BREAKERS AND A MINIMUM UL SHORT CIRCUIT RATING AS SHOWN ON THE DRAWINGS. EACH BREAKER SHALL HAVE ITS CURRENT RATING ENGRAVED, IN EASY TO READ NUMBERS, ON THE TOGGLE HANDLE. UL LISTED "SWD" SWITCHING DUTY FOR LIGHTING SWITCHING CONTROL. UL LISTED HACR RATED FOR MOTOR OR HIGH INDUCTANCE LOADS.

# 11 WIRING DEVICES

- A. WIRING DEVICES SHALL BE INSTALLED IN METAL DEVICE BOXES.
- B. SWITCHES AND RECEPTACLES SHALL BE HUBBELL, BRYANT, LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL SUBJECT TO APPROVAL BY THE ENGINEER, COLOR SHALL BE GREY FOR NORMAL POWER AND RED FOR EMERGENCY POWER. SPECIAL COLOR DEVICE OUTLETS AND MATCHING COVERPLATE AS NOTED ON THE PLANS.
- C.SWITCHES SHALL BE HEAVY DUTY GRADE, FEDERAL SPECIFICATION FS, AC QUIET TYPE, 20-AMP, 120/277-VOLT, WITH SILVER ALLOY CONTACTS, EQUAL TO
- D. GENERAL PURPOSE DUPLEX RECEPTACLES SHALL BE HEAVY DUTY GRADE, FEDERAL SPECIFICATION FS. NEMA 5-20R. 20-AMP. 125-VOLT. 3-WIRE GROUNDING TYPE DEVICES WITH STEEL ONE PIECE GROUND STRAP; THIRD POLE GROUNDING TO THE OUTLET BOX. HOSPITAL GRADE DUPLEX RECEPTACLES IN PATIENT CARE AREAS DEFINED PER NEC ARTICLE 517. FED
- SPEC GRADE. E. GROUND FAULT CIRCUIT INTERRUPTER (GFI) DUPLEX RECEPTACLES: HEAVY DUTY GRADE, FEDERAL SPECIFICATION FS, 20-AMP DEVICES. GFI RECEPTACLES UNIT WIRED SELF-CONTAINED AND NOT BE CONNECTED TO FEED THROUGH UNLESS SPECIFICALLY NOTED ON THE DRAWINGS. HOSPITAL GRADE DUPLEX RECEPTACLES IN PATIENT CARE AREAS DEFINED PER NEC
- F. NEC WEATHER RESISTANT RATING IN DAMP OR WET LOCATIONS, SUITABLE
- FOR "WHILE-IN-USE" APPLICATIONS..
- G. TAMPER RESISTANT RATING IN AREAS REQUIRED BY THE NEC.
- H. AFCI OUTLETS WHERE REQUIRED BY THE NEC. I. COVER PLATES: STAINLESS STEEL TYPE 302 AS MANUFACTURED BY EAGLE, BRYANT, GENERAL ELECTRIC, HUBBELL OR LEVITON.

J. GFCI PROTECTED WITH "WHILE-IN-USE" WEATHERPROOF COVERPLATES FOR

- OUTDOOR WEATHERPROOF DUPLEX RECEPTACLES, CAST METAL COVERS. PLASTIC OR ACRYLIC COVERS WILL NOT BE ACCEPTED.
- 2.12ENCLOSED SWITCHES, CIRCUIT BREAKERS AND CONTROLLERS

SWITCHES FOR INTEGRALLY PROTECTED MOTORS.

- A. FULL VOLTAGE NON REVERSING STARTERS SIZE 0 MINIMUM. B.FRACTIONAL HP STARTERS QUICK MAKE QUICK BREAK SINGLE POLE
- C. ALL DEVICES NEMA RATED FOR THE ENVIRONMENT THEY ARE LOCATED.

A. SERVICE ENTRANCE: MODULAR DESIGN WITH PEAK SINGLE IMPULSE SURGE CURRENT RATING OF 240KA PER MODE/480KA. TYPE 2 SURGE SUPPRESSION (SPD) AT THE MAIN ELECTRICAL SERVICE SHOWN ON THE DRAWINGS.

# 2.14LIGHTING FIXTURES

A. LED FIXTURES: LIGHT ENGINE DRIVERS AS SPECIFIED ON THE DRAWINGS.

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IN ACCORDANCE WITH THE NEC, IEEE AND BEST PRACTICES.

SYSTEMS SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250.

D.PROVIDE A MINIMUM #6 COPPER GROUND CONDUCTOR, OR LARGER AS INDICATED ON THE DRAWINGS, AND A 12" GROUND BUS AT

A.CONDUIT AND CABLE SUPPORT DEVICES TO BE STEEL WITH HANGERS AND

B. FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES TO BE BOLTED

3. DRY LOCATIONS AND NOT SUBJECT TO MECHANICAL INJURY: EMT, IMC OR RMC.

4. IN DAMP OR WET LOCATIONS FLEXIBLE CONNECTIONS TO BE LIQUID TIGHT TYPE

F. FITTINGS FOR EMT SHALL BE STEEL COMPRESSION TYPE OR STEEL

H. PROVIDE EXPANSION FITTINGS CROSSING EXPANSION JOINTS OR SPANNING

I. INSTALL SURFACE RACEWAYS WITH REQUIRED FITTINGS, ACCESSORIES AND

2. RUN CONDUIT PARALLEL TO OR AT RIGHT ANGLES TO CENTER LINES OF

3. CONDUITS ABOVE CEILING SHALL NOT OBSTRUCT REMOVAL OF CEILING TILES,

1. SUPPORT CONDUITS WITH UNDERWRITER'S LABORATORIES LISTED STEEL

CODE. WIRES OR SHEET METAL STRIPS ARE NOT ACCEPTABLE FOR CONDUIT SUPPORT. USE CONDUIT HANGERS FOR CONDUITS NOT DIRECTLY FASTENED

TO STRUCTURE AND FOR MULTIPLE CONDUIT RUNS. DO NOT ATTACH ANY

1. ROOF OR EXTERIOR WALL: AVOID PENETRATING ROOF OR EXTERIOR WALL WHERE POSSIBLE. WHERE PENETRATIONS ARE NECESSARY, BUILDING

STRUCTURAL STEEL OR STEEL SLOTTED SUPPORT SYSTEMS CALCULATED BY

CONDUCTOR RUN WITH THE PHASE AND NEUTRAL CONDUCTORS.

SUPPORTS SUITABLE FOR RACEWAY OR CABLE TO BE SUPPORTED.

TELECOMMUNICATION DEMARCATION LOCATION.

A REGISTERED STRUCTURAL ENGINEER.

1. ABOVE GROUND: USE EMT. IMC OR RMC ONLY.

4. DAMP OR WET LOCATIONS: IMC OR RMC

BETWEEN ISOLATED STRUCTURES.

DEVICE OUTLETS NOTED ON PLANS.

LIGHTING FIXTURES, AIR DIFFUSERS, ETC.

CONDUIT TO MECHANICAL DUCTS OR PIPES.

WEATHERPROOF INTEGRITY MUST BE PRESERVED.

J. GENERAL CONDUIT INSTALLATION:

COLUMNS AND BEAMS.

K. CONDUIT SUPPORTS:

L. CONDUIT PENETRATION:

1. RECESSED LIGHTING FIXTURES.

2. MOTOR CONNECTIONS.

3. AT BUILDING JOINTS.

A. ENCLOSE ELECTRICAL POWER WIRING IN CONDUIT.

B. PERMITTED USES FOR EMT, IMC OR RMC AS FOLLOWS:

2. LOCATIONS SUBJECT TO MECHANICAL INJURY. IMC OR RMC ONLY.

C.USE FLEXIBLE CONDUITS IN THE FOLLOWING APPLICATIONS:

D. CONDUIT CAST IN CONCRETE FLOORS ARE NOT ALLOWED.

SET-SCREW TYPE. DIE CAST FITTING ARE NOT ALLOWED.

E. CONDUIT BELOW GRADE TO BE PVC OR IMC OR RMC.

G.INSTALL NYLON PULL CORDS IN EMPTY CONDUITS.

1. CONDUIT ACCEPTABLE TO BE SURFACE MOUNTED.

3.5 RACEWAYS AND OUTLET BOXES

3.4 HANGERS AND SUPPORTS

2. NON-FIRE RATED DRY WALL: CONDUIT SLEEVES ARE NOT REQUIRED. PENETRATIONS MUST BE SEALED WITH PLASTER PRIOR TO PAINTING. PENETRATIONS MADE AFTER WALL FINISH IS APPLIED MUST BE AS SMALL AS POSSIBLE AND PROVIDED WITH ESCUTCHEONS, ONE ON EACH SIDE OF WALL. M.OUTLET BOXES:

CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. GOVERN EXACT 1. PROVIDE OUTLET BOXES AND PULL BOXES AS REQUIRED TO ACCOMMODATE LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING.

3. ALL OUTLET BOXES SHALL BE TWO-GANG OR 4" SQUARE X 2" DEEP MINIMUM END OF SECTION

WITH PLASTER RING SIZED AS REQUIRED. THREADED HUBS.

#### 3.6 UNDERGROUND RACEWAYS AND BOXES

- A. UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC, IMC OR RMC BURIED IN EARTH. TRANSITIONS THROUGH CONCRETE SLABS, PRE MANUFACTURED BENDS OR ELBOWS TO BE IMC OR RMC CONDUIT WITH CORROSION
- B. INSTALL UNDERGROUND TRACEABLE, PLASTIC WARNING TAPE 12" ABOVE EACH FEEDER CONDUIT OR GROUPS OF BRANCH CIRCUIT CONDUITS.
- C.INSTALL EXTERIOR BRANCH CIRCUIT OR FEEDER HANDHOLES IN LANDSCAPE AREAS. DO NOT INSTALL IN SIDEWALKS, ROADWAYS OR PARKING LOT SUBJECT TO PEDESTRIAN OR VEHICLE TRAFFIC.

#### 3.7 IDENTIFICATION AND LABELING

- A.PROVIDE NAMEPLATES FOR SWITCHGEARS. PANELBOARDS. AND SIMILAR DEVICES. NAMEPLATES SHALL BE SCREWED (NO ADHESIVE) ENGRAVED PLASTIC OR PHOTO-ETCHED METALLIC NAMEPLATE IDENTIFICATION SHOWING PANEL DESIGNATION, VOLTAGE AND PHASE.
- B. PROVIDE MACHINE LABELS ON LIGHTING SWITCHES AND CONVENIENCE AND SPECIAL PURPOSE RECEPTACLES TO SHOW PANEL AND CIRCUIT NUMBER TO WHICH THE DEVICE IS CONNECTED.
- C.PANELBOARD SCHEDULES: AFTER COMPLETION OF WORK, PROVIDE TYPEWRITTEN UPDATED PANELBOARD SCHEDULES IN A METAL FRAMED CIRCUIT DIRECTORY INSIDE EACH PANELBOARD COVER, WITH PLASTIC PROTECTOR.

#### D. COLOR CODE WIRES AS FOLLOWS:

- 2. 120/240V BLACK, RED, WHITE, GREEN.
- E. PROVIDE BRADY WIRE MARKERS WHERE NUMBER OF CONDUCTORS IN A BOX EXCEEDS FOUR.

- A.CONTROLLERS: FURNISH 120 VOLT POWER TO EACH CONTROL PANEL AND TIME SWITCH REQUIRING A SOURCE OF POWER TO OPERATE.
- B. PULL THE CIRCUIT NEUTRAL CONDUCTOR TO ALL LIGHT SWITCHES. PROVIDE DEDICATED NEUTRAL TO EACH INDIVIDUAL CONTROL.
- C.TESTING AGENCY: ENGAGE A QUALIFIED TESTING AGENCY TO EVALUATE LIGHTING CONTROL DEVICES AND PERFORM TESTS AND INSPECTIONS. TESTING AGENCY SHALL BE INDEPENDENT OF DESIGN, CONSTRUCTION, AND MANUFACTURE OF EQUIPMENT. PROVIDE FUNCTIONAL TESTING AND CERTIFICATION IN ACCORDANCE WITH THE LATEST EDITION OF ASHRAE 90.1.

- A. WHERE PANELBOARDS ARE FLUSH MOUNTED IN WALLS, PROVIDE A MINIMUM OF 4-1" CONDUITS STUBBED TO AN ACCESSIBLE CEILING ABOVE THE PANEL FOR FUTURE USE.
- B. CIRCUIT NUMBERS APPEARING ON DRAWINGS SHALL BE USED FOR REFERENCE ONLY. ACTUAL CONNECTIONS SHALL BE IN ACCORDANCE WITH B. ELECTRICAL SERVICE AND SEPARATELY DERIVED ALTERNATING CURRENT PHASING OF THE CABINET AND LOAD BALANCE REQUIREMENTS. ROOM NUMBERS OR NAMES USED FOR CIRCUIT IDENTIFICATION SHALL CORRESPONDED TO NAME PLATES INSTALLED ON ROOM DOORS BY THE C. ALL FEEDER AND BRANCH CIRCUITS SHALL HAVE A GREEN COPPER GROUND GENERAL CONTRACTOR OR AS SELECTED BY THE OWNER AND SHALL BE VERIFIED AS THESE MAY NOT BE THE SAME AS ROOM TITLES ON THE
  - DRAWINGS. C. TOP OF PANELBOARD TUBS SHALL BE 6'-6" ABOVE FINISHED FLOOR.

# 3.10 WIRING DEVICES

- A.FURNISH AND INSTALL WALL PLATES FOR FLUSH MOUNTED WIRING DEVICES AND FLUSH MOUNTED SPECIAL SYSTEM OUTLETS. SECTIONAL WALL PLATES SHALL NOT BE USED. BLANK PLATES SHALL BE INSTALLED OVER OUTLETS PROVIDED FOR FUTURE USE. WALL PLATES SHALL BE SECURED WITH MATCHING SCREWS. ENGRAVED WALL PLATES SHALL HAVE BACK FILL.
- B. FURNISH AND INSTALL OUTLETS FOR AND MAKE FINAL ELECTRICAL CONNECTIONS TO ELECTRICALLY POWERED EQUIPMENT INDICATED ON THE PLANS OR EQUIPMENT SCHEDULES.

# 3.11ENCLOSED SWITCHES, CIRCUIT BREAKERS AND CONTROLLERS

- A.FURNISH AND INSTALL MANUAL THERMAL PROTECTION FOR MOTORS NOT INTEGRALLY EQUIPPED WITH THERMAL PROTECTION.
- B.FURNISH AND INSTALL FINAL ELECTRICAL CONNECTIONS TO MOTORS AND ELECTRICALLY POWERED EQUIPMENT INDICATED ON THE PLANS OR EQUIPMENT SCHEDULE.
- C.FURNISH AND INSTALL A DISCONNECT SWITCH IMMEDIATELY AHEAD OF AND ADJACENT TO EACH MAGNETIC MOTOR STARTER OR APPLIANCE UNLESS THE MOTOR APPLIANCE IS LOCATED ADJACENT AND WITHIN SIGHT OF THE SERVING PANELBOARD, CIRCUIT BREAKER OR SWITCH. VERIFY EQUIPMENT NAMEPLATE CURRENT RATINGS PRIOR TO INSTALLATION.
- D.FURNISH AND INSTALL DISCONNECT SWITCHES HAVING THE NUMBER OF POLES AND AMPERE RATINGS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN EQUIPMENT SCHEDULES.

# 3.12 SURGE PROTECTIVE DEVICES (SPDS)

# A. INSTALLED IN ACCORDANCE WITH NEC ARTICLE 285.

- B. INSTALL AN OCPD OR DISCONNECT AS REQUIRED TO COMPLY WITH THE UL LISTING OF THE SPD.
- C.INSTALL SPDS WITH CONDUCTORS BETWEEN SUPPRESSOR AND POINTS OF ATTACHMENT AS SHORT AND STRAIGHT AS POSSIBLE. AND ADJUST CIRCUIT-BREAKER POSITIONS TO ACHIEVE SHORTEST AND STRAIGHTEST LEADS. DO NOT SPLICE AND EXTEND SPD LEADS UNLESS SPECIFICALLY PERMITTED BY MANUFACTURER. DO NOT EXCEED MANUFACTURER'S RECOMMENDED LEAD LENGTH. DO NOT BOND NEUTRAL AND GROUND.
- D.USE CRIMPED CONNECTORS AND SPLICES ONLY. WIRE NUTS ARE UNACCEPTABLE.

# CONDUIT SUPPORTS AT INTERVALS REQUIRED BY THE NATIONAL ELECTRIC 3.13LIGHTING FIXTURES

- A.LIGHTING FIXTURES: SET LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS COMPLYING WITH NFPA 70 FOR FIXTURE SUPPORTS. PROVIDE LAMPS IN FACH FIXTURE.
- B. ADJUST AND AIM LIGHTING FIXTURES TO PROVIDE REQUIRED LIGHT INTENSITIES ON VERTICAL SURFACES OR AT DIRECTIONS NOTED ON DRAWINGS. PROVIDE ADDITIONAL ADJUSTMENTS FOR OWNER PRIOR TO FINAL TURNOVER OR AT SUBSTANTIAL COMPLETION.

C.LIGHTING FIXTURES MOUNTED IN CONTINUOUS ROWS MAY BE END FED WITH ONLY THE CIRCUITS FEEDING THE ROW (PASSING THROUGH OF OTHER CIRCUITS NOT ALLOWED) WITH EACH ROW FED FROM INDIVIDUAL JUNCTION BOXES AT THE END FEED POINT.

D. LIGHTING FIXTURES MUST HAVE INDIVIDUAL FEEDS TO EACH FIXTURE EXCEPT FOR TANDEM FIXTURES. "DAISY-CHAINING" OF FIXTURES NOT ALLOWED. THE LIGHTING FIXTURE WHIPS MUST BE 6-FEET LONG OR LESS.



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